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Ross A Hull
VHF
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THE WIA RADIO AMATEUR'S JOURNAL

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AMATEUR RADIO

THE WIA RADIO AMATEURS JOURNAL

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Cover

The recently refurbished Ross Hull Memorial Trophy. The inscription reads "To perpetuate the memory of an Australian amateur - an early member of the WIA - who devoted his life to the amateur cause and who pioneered the VHF field during his brilliant career as Editor of "QST" and "The Radio Amateur's Handbook". Born in Melbourne in 1902 his untimely passing in 1938 was a great loss to the amateur fraternity and the world of Radio Communications generally". *Photo - Peter Hoare*

End Of The Decade

EDITOR'S COMMENT

BILL RICE VK3ABP EXECUTIVE EDITOR

It seems quite unusual for me to be typing an editorial; so much so that I don't quite know where to start! October was the last time I found myself faced with a blank sheet awaiting the first keystrokes of what became "No Free Lunches". This time the title would perhaps be more appropriate to next December, but 1990 is certainly the last year of the decade, and the 80th Anniversary of the foundation of the WIA. May it prove to be a very auspicious year for us all.

The November editorial (Ship of the Desert) was hand-written in a great hurry at Port Augusta, and then last month I was happy to hand the space over to Peter Gamble, who had much more of importance to say than is usually the case with my little waffle! But now, duty calls again, as it has on many occasions since we returned from VK5 in time for the November proof read. Since then we have had the November Publications meeting and the much deferred joint Executive/Council meeting (a busy week-end!), then the December proof read, plenty of editorial action (but still dragging the chain!) and tomorrow the December meeting, which is also the January deadline. Never a dull moment, is there?

Hopefully, having at least temporarily managed to get a few VK5 salt lakes out of the system, it may now be possible to catch up a little on the backlog of unanswered letters. Maybe even write up that long-promised item on the VK2ABQ antenna. And at least one correspondent has said he wants to see more about the VK3ABP wind and solar power systems on the boat. So my time is well booked up already over the holiday season. Holiday? As one of my work-place colleagues used to say before we both retired "At least it helps to keep us off the streets!".

Just to fill you all in on our activities hinted at in the November issue, we did get to Lake Torrens, launched the boat (with great difficulty), sailed about a day and a half altogether, retrieved the boat (with even greater difficulty) and arrived back home unscathed a few days later. I am sure ours was the first trailer-sailer ever in Lake Torrens, and the only one. Even then, in the deepest part (Beda Arm) the water was barely a metre deep, and evaporating fast. But very recently (28 Nov—3Dec) there have been rains in South West Queensland which will probably put much more water into Lake Eyre North by about February or March. It's on again, folks! If it comes up to expectations this will be the Salt Lake Sailing Safari DXpedition to beat all previous attempts. We may have to install a fax aboard so I can edit by remote control! I hope that last sentence is a jest which doesn't come true, but anything can happen on Lake Eyre. It's almost to the stage of having water in it more often than not, and they say the Greenhouse Effect is not yet upon us.

That's quite enough rambling about my favorite obsession. May we all, members of the Publications Committee, wish you all the very best for 1990. May it very truly be a Happy New Year! **ar**

Will this be your last issue of Amateur Radio magazine?

Was your subscription due on 1st January 1990?

Please pay your subscription immediately to ensure continuity of receipt of Amateur Radio magazine.

Wireless Institute of Australia

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			VK7 Federal Councillor:	Joe Gelston	VK7JG

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Historian:	John Edmonds	VK3AFU	**Videotape:**	John Ingham	VK5KG
Intruder Watch:	Gordon Loveday	VK4KAL	**WICEN:**	Bill Wardrop	VK5AWM

WIA NEWS

BILL ROPER VK3ARZ GENERAL MANAGER & SECRETARY

November Federal Meetings

After having been postponed twice because of the airline dispute, a quarterly meeting of the complete WIA Federal Executive, and a meeting of the Federal Council of the WIA, took place over the weekend of 18th and 19th November 1989. Despite a number of travel difficulties, Executive/Councillors from all interstate Divisions attended the meetings.

Executive and Council were disappointed that the local, Victorian Division member of Executive did not attend the Executive meeting, and that neither the Victorian Division Federal Councillor, nor either of the two Alternate Federal Councillors, attended the Federal Council meeting.

A considerable amount of business was dealt with, and all delegates eventually wearily departed late on the Sunday afternoon.

WARC 92 WIA Team

Executive decided that David Wardlaw, VK3ADW, will be the WIA Planning Team Leader for WARC 92, and the other two members of the Planning Team will be Peter Gamble, VK3YRP, and Ron Henderson, VK1RH.

It was also decided that, subject to available funding, the WIA contribution to the Australian government delegation to WARC 92 will be a minimum of one person and a maximum of two people.

Repeater Linking

Executive decided that the VK4 Division would prepare a draft submission to DoTC, including all technical specifications, and based on all material tabled by WIA Divisions, repeater groups and other interested parties.

This draft was to be circulated to all Divisions before 22nd December 1989 for comment; and all Divisional responses are to be received at the Executive Office before the 23rd January 1990 meeting of the Executive.

Future Contest Managers

Executive resolved that, as from the Federal Convention to be held in April 1990, WIA Contest Management is to consist of a separate Contest Manager for each WIA Contest, with the Federal Contest Manager being a co-ordinator overseeing the operations of the individual Contest Managers.

The VK6 Division member of Executive, Neil Penfold, ad-

WIA DIVISIONS

The WIA consists of seven autonomous State Divisions. Each member of the WIA is a member of a Division, usually their residential State or Territory, and each Division looks after amateur radio affairs within their State.

Division	Address	Officers			Weekly News Broadcasts	1990 Fees
VK1	ACT Division GPO Box 600 Canberra ACT 2601	President Secretary Treasurer	Ted Pearce Jan Burrell Ken Ray	VK1AOP VK1BR VK1KEN	3.570 MHz 2m ch 6950 70cm ch 8525 2000 hrs Sun	(F) $65.00 (G) (S) $52.00 (X) $39.00
VK2	NSW Division 109 Wigram St Parramatta NSW 2124 (PO Box 1066 Parramatta) Phone (02) 689 2417	President Secretary Treasurer (Office hours	Roger Henley Peter Balnaves David Horsfall Mon-Fri 11.00 - 14.00 Wed 19.00 - 21.00)	VK2ZIG VK2CZX VK2KFU	(R Denotes repeater) Times 1045 and 1915 on Sunday 1.845 MHz AM, 3.595 AM/SSB , 7.146 AM (1100 only) 28.320 SSB, 52 120 SSB 52.525 FM 144.12 (SSB) 147.000 FM(R) 438.525 FM(R) 584.750 (ATV Sound) 1281.75FM (R) Relays also conducted via many repeaters throughout NSW.	(F) $59.00 (G) (S) $47.00 (X) $33.00
VK3	Victorian Division 38 Taylor St Ashburton Vic 3147 Phone (03) 885 9261	President Secretary Treasurer	Jim Linton Barry Wilton Rob Hailey	VK3PC VK3XV VK3XLZ	1.840 MHz AM, 3.615 SSB, 7.085 SSB, 147.250 FM(R) Mt Macedon, 147.225 FM(R) Mt Baw Baw 146.800 FM(R) Mildura, 438.075 FM(R) Mt St Leonard 1030 hrs on Sunday	(F) $65.00 (G) (S) $52.00 (X) $39.00
VK4	Queensland Division GPO Box 638 Brisbane Qld 4001 Phone (07) 284 9075	President Secretary Treasurer	David Jones John Aarsse Eric Fittock	VK4NLV VK4QA VK4NEF	3.605 MHz, 7.118, 14.342, 18.132, 21.175, 28.400, 52.525 regional 2m repeaters and 1296.100 0900 hrs Sunday Repeated on 3.605 & 147.150 MHz, 1930 Monday	(F) $65.00 (G) (S) $52.00 (X) $39.00
VK5	South Australian Division Thebarton Rd West Thebarton SA 5031 (GPO Box 1234 Adelaide SA 5001) Phone (08) 352 3428	President Secretary Treasurer	Don McDonald Hans van der Zalm Bill Wardrop	VK5ADD VK5KHZ VK5AWM	1820 kHz 3.550 MHz, 7.095, 14.175, 28.470, 53.100, 145.000, 147.000 FM(R) Adelaide, 146.700 FM(R) Mid North, 146.900 FM(R) South East, ATV Ch 34 579.00 Adelaide, ATV 444.250 Mid North (NT)3.555, 146.500, 0900 hrs Sunday	(F) $65.00 (G) (S) $52.00 (X) $39.00
VK6	West Australian Division PO Box 10 West Perth WA 6005 Phone (09) 474 2626	President Secretary Treasurer	Alyn Maschette Bruce Hedland - Thomas	VK6KWN VK6OO	146.700 FM(R) Perth, at 0930 hrs Sunday, relayed on 3.560, 7.075, 14.115,14.175, 21.185, 28.345, 50.150, 438.525 MHz Country relays 3582, 147.350(R) Busselton 146.900(R) Mt William (Bunbury)147.225(R) 147.250 (R) Mt Saddleback 146.725(R) Albany 146.825(R) Mt Barker Broadcast repeated on 3.560 at 1930 hrs.	(F) $56.00 (G) (S) $45.00 (X) $30.00
VK7	Tasmanian Division PO Box 1010 Launceston TAS 7250	President Secretary Treasurer	Mike Wilson Bob Richards Peter King	VK7ZWW VK7NRR VK7ZPK	146.700 MHz FM (VK7RHT) at 0930 hrs Sunday relayed on 147.000 (VK7RAA), 146.750 (VK7RNW), 3.570, 7.090, 14.130, 52.100, 144.100 (Hobart) Repeated Tues 3.590 at 1930 hrs	(F) $63.00 (G) (S) $50.00 (X) $38.00
VK8	(Northern Territory) is part of the VK5 Division and relays broadcasts from VK5 as shown (received on 14 or 28 MHz).					

Note: All times are local. All frequencies MHz.

Membership Grades
Full (F) Pension (G)
Needy (G) Student (S)
Non receipt of AR (X)

vised that his Division will arrange for this new system to be in place by the 1990 Federal Convention.

6 and 10 Metre Beacons

Executive accepted the Federal Technical Advisory Committee's recommendation that the Australian 28.2 MHz international time shared beacon be located in Sydney, and that all other Australian 10 metre beacons be moved to the regional frequency of 28.191 MHz time shared as soon as practicable after 1st January 1990.

Executive also resolved that there are to be no beacons in the 50 - 52 MHz segment of the 6 metre band in those states with restrictions on band usage (VK1, 2, 3, 4, & 7); to agree with the VK8 proposal for a beacon on 50.056 MHz; not to support the use of any more discrete frequencies for beacons due to frequency limitations; and to adopt time sharing of beacons on 50.056 and 50.066 MHz, as and when additional demands are made for beacons in this segment of 6 metres, with 50.056 MHz to be used north of the Tropic and 50.066 MHz south of the Tropic of Capricorn.

Executive and WIA Members

Considerable time at the Executive meeting was spent discussing the continued objection by the VK3 Division as to what they perceive as the Executive and the Executive Office incorrectly communicating directly with clubs or members of the Victorian Division of the WIA on matters other than those directly related to membership subscriptions and/or renewals.

Executive considers that it, and the Executive Office, have been operating properly and in accordance with Article 46 of the Articles of Association of the WIA.

Nevertheless, because of the VK3 Division's objections, Executive decided to seek from Divisions their views on which administrative matters they believe should not be dealt with by Executive and, conversely, those matters which they require Executive to carry out, with a view to producing a consensus list for adoption by Federal Council.

Federal Council Meeting

Two motions were put, discussed, and passed at the Federal Council meeting (known, in the terms of the Articles of Association, as an Extra-ordinary Federal Convention).

The first motion expressed the serious concern of the Council in regard to the broadcast of the VK3 Divisional President on 29th October 1989 because of it having the effect of promoting disunity within the amateur service by the use of selective quotations, emotive language, and distortion of the facts which Council considered as not being in the best interests of amateur radio.

The second motion set a very clear policy to be used by all Divisions of the WIA in their handling of the Federal News Tapes provided by Executive.

Further Meeting Details

Minutes of both the Executive and Council meetings have been provided to Divisions (the Executive meeting minutes alone consisted of 49 pages of material!), and members wanting to know more details of what went on at those meetings can obtain further information by contacting their local Federal Councillor.

Callsign Number Plates

Radio amateurs living in New South Wales have been able to obtain "custom" amateur callsign number plates for their motor vehicles for some years. However, I understand that not many amateurs have availed themselves of this facility, possibly because of the high annual cost.

After decades of submissions by the WIA, the Victorian Road Traffic Authority has recently advised that they will now accept orders for "custom" registration plates which can take the form of an amateur two or three letter callsign. These plates will be available in various colours at a once only cost of $260.00. Further details can be obtained from any "Vic Roads" office.

Copies of Magazine Articles

A considerable number of members have obtained copies of the Amateur Radio magazine 20 Year Index from the Executive Office since the facility was announced during October 1989. Approximately half of the indexes have been supplied in hard copy, about 30% on a 5 1/4 inch floppy disk in dBase III Plus .DBF file format, and the remainder on a floppy disk in ASCII format. Details of this index were provided on page 4 of October 1989 issue of Amateur Radio magazine.

Aubrey, VK6XY, has produced a compiled database version of the 20 Year Index which runs on an IBM PC as a stand alone .EXE file. This version of the 20 year Index is now available to members from the WIA Executive Office for $10.00, which includes the floppy disk, plus packing and postage. Incidentally, Aubrey, with the assistance of Vic, VK6NL, is working on building a 20 year Amateur Radio magazine index to cover the years from 1950 to 1969.

No doubt due to the success of the 20 Year Index, our stocks of back issues of Amateur Radio magazine are rapidly depleting as members take advantage of the offer detailed on page 5 of the September 1989 issue.

Therefore, the Executive Office is now introducing a new service to members. When stocks of a back issue of AR are exhausted, a photocopy of the particular article in the back issue that is required will be supplied for a fee of $2.50. If an article spreads over more than one issue of the magazine, it will cost an extra $2.00 for photocopying of the relevant pages of each additional issue of AR in which the article appears.

In future, when you send in your order for a back issue of Amateur Radio magazine, please indicate the particular article in which you are interested.

The Executive Office has a complete library of Amateur Radio magazines from the first issue published in 1932.

Executive Office Flooded

A formerly prominent public figure once said "life wasn't meant to be easy". Tell me about it!

Recent times in the Executive Office have been rather hectic, what with the 1990 Call Book, the airline dispute, cross linking of repeaters, political bickering, censorship of the Federal Tapes, changing over to a new membership database computer, and the usual problems because of lack of adequate financial resources, just to name a few.

But it was almost the last straw when I opened the door of the Executive Office at 7.30 AM on Saturday, 18th November, to complete preparations for the weekend-long Executive and Federal Council meetings, and found myself walking in water.

A cold water pipe had burst, apparently only about two hours before I arrived, and had already flooded half the total floor area of the office.

Amidst the flurry of plumbers, mopping up of some of the water, and re-arranging of the furniture, the meetings eventually started more-or-less on time in the cramped, dry half of the

office.

However, for a period of two weeks, the Executive Office looked like a bomb had gone off! Half the carpet had to be pulled up and taken away for treatment (naturally, the half of the office that was flooded just had to be the records and filing section, and not the open work area!).

Piles of records, books, magazines, filing cabinets and assorted furniture were scattered around the building (the other tenants of the office building were very generous in their offers of temporary storage space), and the half of the office into which the staff were crammed looked like the set from "Steptoe and Son".

But we managed, and hopefully members did not notice any falling off in the services offered by the Executive Office during that traumatic period.

1990 WIA Fees Due

Have you paid your renewal fee yet?

During the second week of December, over 5500 members of the WIA received their annual membership renewal notices. Full details of the 1990 fees were explained in December issue of Amateur Radio magazine.

Please pay your fees immediately if you don't want to miss out on the special February 1990 "Reference" issue of Amateur Radio magazine. And don't forget, if you want to be "canny" with your money and transfer over to a three year membership, all you have to do is forward your remittance for an amount equal to 3 times the figure that appears on your renewal notice.

With all the discussion that has taken place over the past few months about the "catch up" increase in the WIA fees to a maximum of $65.00 for a majority of the Divisions, it is worthy of note that the New Zealand equivalent of the WIA, the NZART, has also set its' 1990 fees at $65.00.

Incidentally, it is also interesting to note that the NZART Call Book costs $15.20 to NZART members, and $20.25 to non-members.

Entries for the WIA 80 competition to win an ICOM IC-900A multi-bander system continue to pour into the Executive Office. Please remember that you need to be a financial member of the WIA as at 1st February 1990 to qualify for this exciting competition.

New JARL Satellite

When advising of the termination of the amateur satellite JAS-1/Fuji-OSCAR 12 as from 5th November 1989, Shozo Hara, the President of the Japan Amateur Radio League advised that JARL is preparing for its next satellite.

This new bird, the JAS-1b, will have the same mission configuration as that of FO-12, except for its orbit, and is expected to be launched in February 1990.

6 Metres in New Zealand

News from the NZART in New Zealand is that radio amateurs in that country have been granted limited use of the low end of the 6 metre band on conditions somewhat similar to those won for Australian amateurs by the WIA during the early part of 1989.

The New Zealand RFS has announced limited 24 hour use of the segment 50.00 to 50.15 MHz to specific amateurs operating from a fixed location not closer than 50 km from the service boundary of a TV Channel 1 service area or of a TV translator using Channel 1 as its input.

WIA Weekly News

Do you regularly listen to your Division's weekly news broadcast?

Have a look at the list of broadcast times and frequencies on page 3 of each issue of Amateur Radio magazine.

Collectively, the WIA Divisions provide for Australian radio amateurs one of the most comprehensive radio news services of any amateur society in the world. It is just one of the many services provided by the WIA which benefit all amateurs, not just members.

Each week a lot of people go to a lot of time and trouble to keep the Australian amateur up-to-date with amateur radio news and views, and the result is both comprehensive and professional. Many, many hours of work are put into each half hour broadcast.

As regular listeners will be aware, the one item which is usually the same in each Division's news broadcast is the weekly "Federal Tape". And members of the WIA will also know that many of the news items that appear on the "Federal Tape" also appear in WIA NEWS in Amateur Radio magazine, often in more comprehensive form.

How many members listen to the news broadcasts provided by other Divisions? Because each Division is an individual and separate member of the WIA, each Division's broadcast is different, often with differing viewpoints on the same news item. Quite often general news items will appear in one Division's broadcast and not in another.

It is most enlightening to learn what is happening in another state. Even though the majority of Divisions present their weekly news broadcast at staggered times on a Sunday morning, not everybody finds that a suitable time at which to listen. Therefore, it is quite common for news – seeking amateurs to tape record their Division's news broadcast, as well as the broadcasts from some of the other Divisions, and play them back at their convenience.

Do you keep yourself abreast of what is happening in the amateur community by listening to one or more of the WIA weekly news broadcasts?

WIA 80 Awards

The first dozen WIA 80 Awards have already been allocated and they all went to amateurs in North America. WIA 80 Award certificate No. 1 went to Michael Pagan, N2GBH, who qualified at 1240 Z on 4th November 1989, just 2 minutes ahead of Howard Hatch Jr, AB4DU, who made it at 1242 Z the same day.

Howard's certificate was endorsed "First for North Carolina", and the Federal Awards Manager, Ken Gott, VK3AJU, tells me that the first dozen certificates include ones with "First for" Florida, Maryland, Ohio, Mississippi, Iowa and Alabama endorsements. Certificate No. 6 went to Bruce Balla, VE2QO, endorsed "First for Canada".

Ken has initiated correspondence with the UK, USSR, and Japan, amongst a number of other countries, to see if there is interest in agreeing on a day, or days, when amateurs in those countries, who are interested in obtaining the WIA 80 Award, could count on sufficient VKs being on air.

If the interest from overseas is apparent, times and frequencies for these occasions during 1990 will be announced well in advance in the Federal Tapes and in Amateur Radio magazine.

Ken tells me he is not surprised that there have not been any VKs among claimants for low-number certificates. DX amateurs need only eight QSOs to win the Award, while VKs need eighty! "From what I hear on local nets," Ken said, "most VKs have taken the view that they have 14 months in which to make the QSOs, so there's really no hurry."

Ken went on to say, "All the same, its a good idea to keep your WIA membership number by you in the shack, if you don't carry it in your head. When a stateside station asked me for my WIA number early in November, I was caught flat-footed and had to beg off for a couple of minutes to find it!"

The WIA 80 Award rules call for the quotation of your WIA

membership number which appears on your membership certificate or, failing this, the six-digit number on your Amateur Radio magazine address label. The full rules of this interesting award appear on page 4 of September 1989 issue of Amateur Radio magazine.

Amateur Exams

It is now nearly four years since the possibility of devolvement of amateur examinations was raised by the Department of Transport and Communications (DoTC). The process is finally nearly completed, and this seems to be an appropriate time to have an overall look at the devolvement story.

Amateur examinations were the last in a series of tests and examinations conducted by DoTC which it was prepared to hand over to external bodies. TAFE colleges had accepted responsibility for Broadcast Operator certificates, and examinations for Marine licences were being conducted by the Maritime College.

When it became apparent that a policy of full cost recovery was to be pursued in Commonwealth departments, DoTC approached the WIA with proposals for the external conduct of amateur examinations.

As with any change to existing conditions, this proposal generated a considerable amount of debate in the Australian amateur community, sometimes very heated, sometimes non-constructive. Fortunately, however, a majority of amateurs accepted the inevitable, and tried to offer useful suggestions.

Because of resource problems in DoTC, the matter moved fairly slowly until early in 1989 when Keith Carr-Glynn was appointed by DoTC to the position of Examinations Officer. Keith was able to pick up all the threads and concentrate on production of the necessary examination materials, a task which is now almost completed.

There has been close liaison between DoTC and the WIA at all times, and the current position is as follows. The question banks for Novice theory, AOCP/AOLCP theory and Regulations have been produced, a Morse code examination generating program has been produced by DoTC and refined by a VK1 WIA member, a computer program to generate question papers from the banks has been developed for DoTC by a VK5 WIA member, and procedures for accreditation of examinations have been published.

In addition, the new regulations brochures, DOCs 70, 71 and 72 have been completed and published.

All these examination materials have been circulated to all those people and organisations who had registered their interest with DoTC in conducting examinations (there are presently over 40 names on the DoTC list), and Keith Carr-Glynn has now stated that he is ready to receive examination papers for accreditation.

If there are any groups or individuals who wish to organise amateur service examinations, but have not yet registered their interest with DoTC, now is the time to check with Mr Keith Carr-Glynn at DoTC in Canberra, or with your WIA Division, for information on the procedures to follow.

ARRL DXCC on 10 MHz

The American Radio Relay League (ARRL) have recently announced that they will now accept QSLs for contacts on the 10 MHz WARC amateur band for credit for the CW, mixed and RTTY DXCC awards.

There are no date restrictions on this change, but please note that there will be no 10 MHz single band DXCC award, and contacts on the 10 MHz band are not valid for the ARRL 5-band DXCC award.

WIA video at ITU-COM 89

ITU-COM 89 was a very successful symposium and exhibition of various aspects of communication organised by the International Telecommunications Union (ITU), and was held at the Palace of Expositions in Geneva from 3rd to 8th October 1989.

An amateur radio stand was erected at this exhibition by the International Amateur Radio Union (IARU) to demonstrate the value of the amateur service to non-amateurs.

This stand included a number of static exhibits, an operating packet-radio station, and a video room with continuously running videos supplied by ARRL, RSGB, JARL and the WIA!

This was yet another exaple of your society working internationally in the continuing fight to protect the amateur service and frequencies.

VNG Update

Marion Leiba, Honorary Secretary of the VNG Users Consortium, tells me that DoTC has now granted VNG's experimental licence on 10 and 15 MHz for a period of one year ending on 30th November 1990, unless there are any serious complaints. Apparently DoTC are still considering the VNG application for 16 MHz.

Marion, who first discovered the existence of amateur radio when she became involved with the resurrection of VNG, has now passed her Novice and Limited licences, and shortly expects to achieve her AOCP. Incidentally, Marion's Novice callsign is VK1VNG.

The article written by Marion entitled "VNG Update", which appeared on page 40 of the November 1989 issue of Amateur Radio magazine, has already been reproduced in at least three overseas shortwave listener magazines, and the photograph of Marion and her son featured on the front cover of the Spanish magazine, "Madridx".

Articles for AR

The articles published in Amateur Radio magazine are voluntary contributions from members of the WIA. Therefore, the aim of the editors to produce a well balanced magazine each month depends almost entirely on what voluntarily submitted articles are in stock and have been processed ready for publication.

If Amateur Radio is not publishing articles that cover your particular interest in amateur radio, it is not because of any editorial policy, but because your fellow amateurs are not writing that type of article.

In the past couple of years, we have had a plentiful supply of articles for publication. So much so that many articles took up to 12 months before they were able to be published. However, the current supply of articles has dwindled to a relatively low level, and many more technical articles are needed.

At the December Publications Committee meeting it was decided to make the June 1990 issue of Amateur Radio magazine a special "Test Equipment" issue. In order to enable technical editing and drawings to be completed in time, this means articles for that special issue will need to be received by the Editor no later than the middle of March 1990.

How about joining in to make the June 1990 "Test Equipment" issue of Amateur Radio magazine a success by submitting your article on construction of a piece of test equipment, modification of test equipment, or even about a test procedure?

A prize will be awarded to the author of the test equipment article which is judged to be the best of those published in that issue of Amateur Radio magazine.

Details of the prize to be won will be announced next month, so start writing your article now.

New 1296 MHz Band Plan

The revised bandplan for the 1296 MHz amateur band, proposed by the VK4 Division at the April 1989 Federal Convention of the WIA, has been cleared

Continued on page 21

PERTH-MELBOURNE-SYDNEY-BRISBANE

STANDARD

NEW TWIN-BAND H/H TRANSCEIVER

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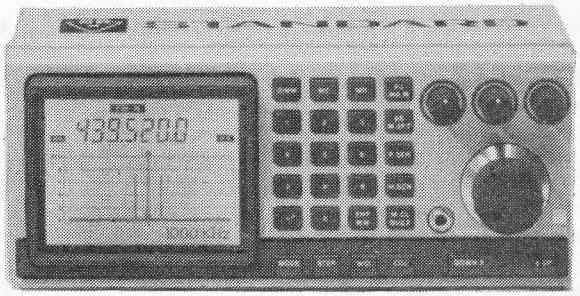
NEW SPECTRUM SCANNER — AX700E



The strange looking liquid crystal display not only shows the frequency, mode, channel and so on, it also displays the spectrum over a range of 100, 250, or 1000 KHZ. The vertical line on the left hand side of the display shows the signal strength and the horizontal line along the bottom is the frequency range. The freq displayed at the top is the frequency at the centre of the line. Now comes the magic. Every time a signal comes up within the freq range, it will show up as a spike on the display. The light will show the signal strength and the position will indicate the frequency. By moving the cursor to the desired spike or unknown signal, its exact frequency will be displayed. To receive the new signal, just press a button. It is possible to monitor visually more than 100 channels simultaneously. If you are looking for a specific signal but you only know the band — just set up the appropriate band edges and then sit back and watch the display. Any appearing signal can be instantly spotted and tuned to in seconds.

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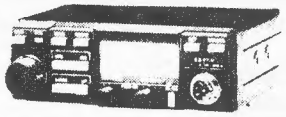

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The Ultimate 2 Metre Hand-held Transceiver

The FT-411 is a top-of-the-line ultra compact 2 metre handheld offering an incredible array of features without the size and weight of previous sets. Expanding on the microprocessor controlled features of previous models, the front panel multi-function back-lit keypad allows easy frequency entry, selection of the 49 tunable memories (which store repeater shifts, or separate Tx/Rx frequencies), setting of the programmable-interval 'power-saver' system, as well as a host of other convenience features. CPU control also offers 2 VFO's, rotary dial tuning with 5 selectable tuning steps, a multi-function back-lit 6 digit LCD screen with bargraph Signal/P.O. meter, and a range of scanning options. Even VOX (voice-activated transmit) circuitry is provided, allowing hands-free operation with the optional YH-2 headset.

Yaesu have also recognised that a hand-held radio must be ruggedly constructed, and yet be small enough and light enough to carry around all day. Through the extensive use of surface-mounted components, a heavy duty die-cast rear panel, rubber gasket seals around all external controls and connectors, and a carry case supplied as standard, the FT-411 will provide reliable operation even in dusty or humid environments while measuring only 55 (W) x 155 (H) x 32mm (D), and weighting less than 550 grams (including a high capacity 1000mAH FNB-14 NiCd battery giving 2.5W output). A range of inexpensive optional accessories are also available to provide flexibility for users differing requirements. See ARA review Vol 12 Issue 3.

Complete Package: FT-411, FNB-14 7.2V NiCd, Carry Case, Antenna, Approved AC Charger.

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CONVERSION OF THE VINTEN MTR29 TO SIX METRES FM

IAN KEENAN VK3AYK
6 PRETORIA ST CAULFIELD SOUTH 3162

Over the last couple of years I have done several conversions of different types of ex commercial mobile low band transceivers to six metres FM. The interest shown was somewhat overwhelming. Recently the Victorian Division of the WIA disposed of a quantity of MTR 29 transceivers. For those lucky enough to get one, details are presented here to get it going on six FM. Melbourne has a new repeater on six metres, VK3RMS on Mt Dandenong, which gives almost blanket coverage of the metro area. Why not install your MTR29 in the car, and get away from the congestion found on two metres.

The Vinten MTR29 made an appearance on the market around the late sixties to early seventies. Generally it was available in 25 and 10 watt versions, namely the MTR29E and MTR29C respectively. Conversion details are given for both. Modifications to the receiver in both models are identical, but the transmitter PAs require individual attention. Before commencing the conversion, it is a good idea to give the unit a thorough visual inspection for missing or damaged components. If it is possible to check the radio on the original frequency for correct operation, do so, as this can save a lot of trouble later on. Remove the twenty years of accumulated grit and grime with a good clean up. Don't forget to evict the resident spider! He usually lives under the IF printed circuit board shield, located under the chassis. You will probably find that the speaker has a rather violent attack of the rattles when the receiver is unmuted. It is therefore best replaced.

Receiver Modifications

The receiver is basically constructed on three circuit boards;

1. RF front end/mixer/ crystal oscillator/multiplier
2. IF and demodulator
3. Audio and muting

The receiver IF frequency is 10.7 MHz and no tweeking of the slugs should be attempted, unless there is a specific fault due to the many pitfalls associated with the alignment of the IF for the unwary.

Moving now to the RF front end/mixer board — remove the shields from the front end coils. Parallel L1 with a 27pF ceramic capacitor, L2 33pF, L3 27 pF, L4 and L5 each with a 10 pF capacitor. These are placed in parallel with the existing capacitors. Then replace the cans. Strictly, the coils should be rewound, instead of just merely padded down to the new frequency. But I found, in this case, there was little alteration to the overall performance of the receiver. The multiplier chain requires no alteration, as the injection in the modified state will be on the high side of RF carrier frequency.

The new crystal formula then becomes;

$$frx = \frac{fc + 10.7}{2}$$

so for 53.9 MHz (VK3RMS down link)

$$frx = \frac{53.9\ MHz + 10.7}{2}$$

$$= 32300.000\ kHz$$

Crystal spec 3rd overtone, Co max = 4.5 pF, ESR max = 30 Ohms holder HC6/7, input capacitance 15pF.

Receiver Alignment

Insert crystal into the appropriate socket, and apply twelve volts. Connect multimeter, on 2.5 Volt range, to test point TP 1 OSC (located behind the speaker on top of the chassis). Adjust the slug of coil 501 for maximum deflection, then adjust L6 for a dip (around .84V). This dip is not very pronounced but with careful attention is noticeable. Turn off the receiver several times, to ensure the oscillator restarts. Disconnect the meter and apply it to test point TP 5 LIM, located on the IF board. Apply a signal at the carrier frequency to the aerial connector. Hopefully, if the signal is large enough, you should be able to hear some signs of life from the speaker. Then adjust L1, L2, L3, L4, L5 and L7 for maximum deflection on the meter. Decrease the output of the signal generator as the front end is gradually brought into alignment. If nothing can be heard, try coupling the signal generator directly via a two turn coupling link into L5; then adjust L7 and L5 for maximum on the meter. Then re-apply the signal generator to the aerial connector, and repeat the above procedure. Tuning should be repeated several times to ensure optimum results.

Note: All cans should be in place when doing this. Finally, net the receiver by applying a known accurate frequency to the aerial socket. With a multimeter on 2.5V range connected to TPG DISC, adjust trimmer C17 for zero meter reading. In my case, I found I had to add a 27pF capacitor in parallel with C17 to achieve this. If you are able to check the sensitivity, it should be about 20dB of quieting for .6 μV input (PD). Not the most sensitive receiver around — but if you feel inclined a preamp will fix that.

Transmitter Modifications

The transmitter is built in two main parts;

1. Exciter, which is built on the main chassis
2. PA board, which is located on the side of the chassis — access is gained by removing the four cover screws and taking off the cover.

The transmitter is phase modulated and, by a process of multiplication of the crystal frequency, the final carrier frequency is obtained. To shift the transmitter to six metres, one tripler stage is changed to a doubler, and the remaining coils in the exciter are padded with capacitance to bring them into the desired tuning range.

Parallel coil 563 with a 47 pF ceramic capacitor, 564 with 18 pF, 565 with 22 pF, and coils 566 and 567 both with 15 pF capacitors. By reference to the circuit diagram, the pin numbers and associated connections of the coils can be determined, and therefore the capacitors soldered directly to the coil base pins under the chassis. This saves pulling the whole can assembly apart.

The crystal formula is now:

$$ftx = \frac{fc}{12}$$

so for 52.9 MHz (VK3RMS up link)

$$ftx = \frac{52.9\ MHz}{12}$$

$$= 4408.333\ kHz$$

Crystal spec - fundamental AT cut, Co max = 7 pF, EPR min = twice DE spec, holder HC/6U, input capacitance 35 pF.

10 Watt PA Mods (MTR29C)

This board consists of three power transistors 2N3866, 2N3375 and 2N3927 to provide the desired power output. Locate coil L200 (on neosid former), and rewind it with eight and a half turns close-wound, using the same gauge wire as the original coil. Moving to coil L201 (neosid former), rewind it with five and a half turns close-wound. The PA output coil L203 should be rewound with fourteen turns close–wound with same wire gauge as the original coil. Finally parallel C215, the PA output loading capacitor, with a 33pF ceramic capactior.

25 Watt PA Mods (MTR29E)

This consists of three stages. A 2N3866 drives a 2N3927, followed by two 2N3927 transistors in parallel in the output stage. The coil associated with the 2N3866 collector output circuit (wound on neosid former) should be rewound with three and a half turns close.

The driver coil (2N3927), which is air wound situated in the middle of two variable capacitors, is rewound with five turns. The two PA output coils are each rewound with five and half turns wire of the same gauge as the original coils. I found during alignment that this board was subject to large spurious problems. If you are unlucky enough to encounter this, the following components should be altered;

1. R126 (exciter) from 100 Ohms to 56 Ohms.
2. The resistors from base to ground of the three 2N3927 transistors on the PA board should each be changed to 47 Ohms.
3. The two 100 pF capacitors feeding the bases of the PA transistors should be changed to 150 pF.

Note: For both the 10 and 25 Watt models, no change is required to the TX output filter.

Transmitter Alignment

Plug the tx crystal into the appropriate socket, connect a power meter to the aerial socket and apply 13.8 V. Operate the push to talk, and with a sensitive high impedance AC voltmeter, locate pin 5 of coil 559, and check it is about 3 volts rms. Next move the AC voltmeter to the base of Q102. Adjust coil 559 for max – about 100mV. Move meter to base of Q103 and adjust coil 560 for max – about 1 Volt rms. Move to base of Q104 and tune coil 561 for max — about 1 Volt rms. With meter connected to the base of Q105, tune coil 562 for max — about 2.3 Volts. Connect meter to base of Q106, and tune 563 for max around 2 Volts AC. Move meter to Q107, and tune slugs of 564 and 565 for max around 2.5 Volts AC. Place meter on pin 5 of coil 567, and adjust 566 and 567 for max — approx .8 volts. Set the supply voltage to 11 volts and repeat above. This ensures the exciter will operate at low voltage. Moving to the respective PA boards, adjust the various stages for maximum output power. Raise the supply voltage to 13.8 Volts and recheck PA board tuning, repeating tuning several times until maximum power is obtained. Remove the crystal and ensure the output power falls to zero. If not, check the PA alignment again. For the MTR29C, the power output should be 10 to 15 watts for slightly over 2 amps, and the MTR29E about 25 to 30 watts for around 5 amps of supply current. Finally, check the carrier frequency by adjusting the crystal netting trimmer C101 for correct frequency. The deviation should be checked with another station for correct level ie 5kHz.

In this description, I have not included the MTR29A. This unit is very common, and the receiver and transmitter exciter modifications described here apply. However, there are differences in the PA board. Those who have an MTR29A, and are contemplating converting it to six metres, might care to contact me if they are stuck!

As stated earlier, the receiver is not very sensitive by todays standards. I would therefore recommend a pre-amp be fitted to the front end. A suitable FET pre-amp was described in the ARRL handbook. Otherwise, you will find others on the band will hear more than you!

In this description, I have endeavoured to make the actual conversion as simple as possible. If you are going to crystal up the unit to operate on 53.5 MHz simplex, a word of warning. The crystal for the receiver when calculated is 32.1 MHz which is third overtone. The fundamental frequency is 10.7 MHz, which is right in the middle of the receiver IF frequency! Not good at all. Therefore avoid this frequency and others close to it. If the local oscillator is injected on the low side, this problem will be solved, but the local oscillator coils will have to be rewound, since they will be taken way past their normal tuning range. Some alterations to the oscillator feed back may also be necessary. For all other frequencies within the band, no problems should be evident and conversion details here apply.

The whole conversion takes about three hours, and at the end you will have gained that sense of pride from doing it yourself, and above all, extra technical knowledge to help you in your hobby. Circuit copies are available from the WIA executive office, at a cost of $2 each.

ar

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BANDWIDTH CONTROL FOR THE VLF-LF RECEIVER

LLOYD BUTLER VK5BR
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In the VLF-LF receiver described in my previous article, AR Dec 89, the bandwidth was set at 3.7 kHz by two Murata 455 kHz Type SFD455D ceramic filters. This bandwidth is ideal for medium bandwidth type modes, such as AM speech, but wider than necessary for narrow band mode signals which exist at frequencies below 100 kHz. These signals are received in the presence of very high noise levels which are inherent to the LF spectrum and the low end of the VLF spectrum. For these signals, an improvement in signal to noise ratio can be achieved by reducing the bandwidth of the receiver. As it turns out, the bandwidth can be narrowed quite simply by switching in a minor circuit change around one of the two ceramic filters.

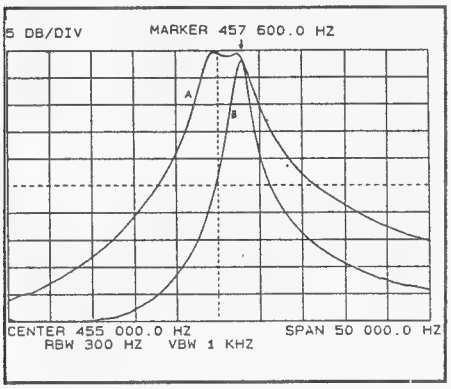

Figure 1
A. Response of the original wideband filter circuit.
B. Response of the narrow band filter circuit.

Curve A of figure 1 plots the spectral response of the original ceramic filter circuit shown in figure 2. The bandwidth of the circuit can be narrowed to less than 1 kHz, by decreasing the 56 pF inter-filter coupling capacitor to 4.7 pF and terminating the filter in a high impedance. The resultant spectral response is shown by curve B of figure 1. The high impedance can be achieved by increasing the value of terminating resistor. However, in the receiver circuit, this resistor is also an input return for the following operational amplifier. Increasing its value without a corresponding change at the amplifier inverting input would affect the DC offset of the amplifier. To avoid changing the inverting input components, the high impedance was achieved by inserting a 4.7 mH choke in series with the original 3 kOhm terminating resistor. The modified circuit for narrow bandwidth is shown in figure 3.

Examining again the narrow bandwidth curve B of figure 1, it can be seen that it peaks at 457.6 kHz. This works out quite well for centring a frequency to give an audio beat with the beat frequency oscillator (BFO) which is locked at 456.85 kHz. Referring back to the original VLF-LF article, the BFO was locked by an element in the same type of ceramic filter unit as used to control the IF bandwidth.

To achieve switching between wide and narrow band, it was found that this could easily be achieved by switching the inter-filter coupling capacitor between 56 pF and 4.7 pF and leaving the 4.7 mH choke in place for both conditions. Figure 4 shows the effect of the choke when leaving it in circuit for the wideband condition. Curve A is the spectral response of the original circuit of figure 2 and curve B is the response with the choke in circuit. It can be seen that the latter condition gives an actual 6 dB gain at the expense of around 3 dB of asymmetrical ripple in the response curve. Whilst the ripple looks untidy on paper, its effect on the practical performance on the receiver is unnoticeable. Furthermore, the 6 dB of gain improvement is also a 6 dB improvement in overall receiver sensitivity which assists reception at the 500 kHz end of the tuning range where the sensitivity falls away.

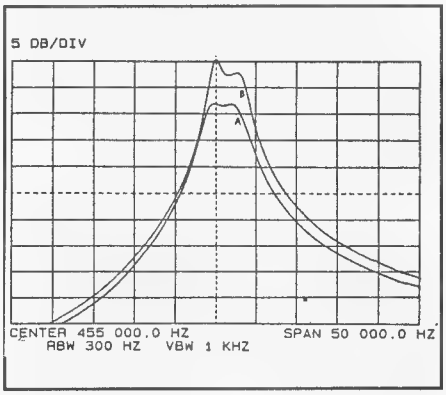

Figure 4
A. Response of original wideband filter
B. Response of wideband filter with 4.7 mH choke left in circuit

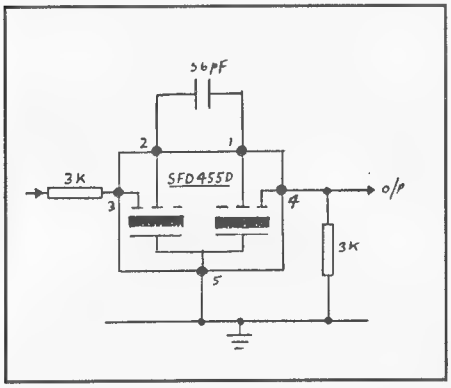

Figure 2 Original wideband filter circuit

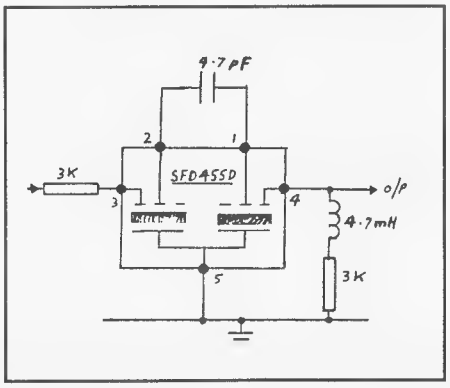

Figure 3 Narrow bandwidth filter circuit

The switchable bandwidth control circuit is shown in figure 5. This was applied to the first ceramic filter in the IF chain because it was the easiest one to access on the already wired up board. (The modification could actually be performed without even removing the card from the receiver box.) Of course, there is no reason why the modification could not have been carried out on the second filter had it been more convenient to achieve. The bandwidth switch was mounted on the receiver front panel and connected into

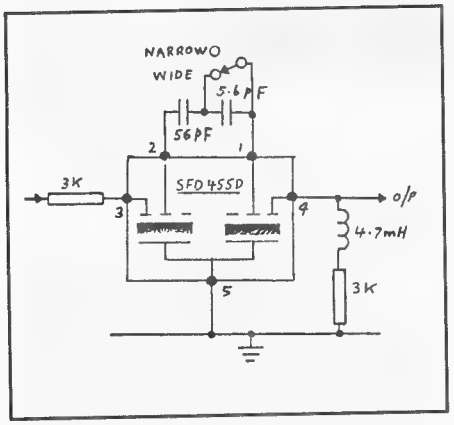

Figure 5 Filter circuit with wide/narrow bandwidth switching

the circuit board via a twisted wire pair. In the circuit shown, the 4.7 pF coupling capacitance for narrow band operation is formed from the series connection of 5.6 pF and 56 pF. Part of the 5.6 pF capacitance is made up of capacitance in the twisted wire pair to the switch. For wide band operation, the 5.6 pF section is shorted out so that the coupling capacitance becomes 56 pF.

Other Applications

The bandwidth control circuit was intended specifically for the LF-VLF receiver but it could well be fitted to any receiver with a 455 kHz IF channel to improve the reception of narrow band mode signals. The Murata ceramic filter is a very versatile little unit considering its cost and size. It can be purchased for but a few dollars and has dimensions of only 7mm x 6mm x 7mm. I have found that by altering the values of source resistance, load resistance and inter-filter coupling capacitance, bandwidth can be set at a range of values between 1 kHz and 7 kHz. (Circuit detail for a bandwidth as wide as 7 kHz was included in the previous article on the VLF-LF receiver.) Not to be overlooked is the additional application of the filter for crystal control of the beat frequency oscillator (refer again the previous VLF-LF receiver article). **ar**

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For the second year in succession, the WIA has managed to hold contract advertising rates at the 1988 level, although casual rates have increased by 7% in accord with CPI. An innovative, corporate style, front cover advertising facility has been made available (full details on request), and a 15% discount is being offered to advertisers for additional space advertising in the same issue.

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MORE ON THE YAESU FT-411

LEW WHITBOURN VK2ZIP
PO BOX 218 LINDFIELD NSW 2070

This micro-sized 2m hand-held radio was reviewed by Ron Fisher, VK3OM, in the June 1989 issue of AR. I wanted to know more about this exciting radio so I approached DSE's Amateur Radio manager, Chris Ayres (VK2YUS), who agreed to let me do a few extra measurements. Here are the results!

Overview Of The FT-411

The FT-411 is the first full featured micro-sized 2m hand-held to reach Australia. It is the same size as the FT-23/73 but with full DTMF (Dual Tone Multi Frequency) keyboard, 49 memories and comprehensive scanning facilities. This makes it comparable in size to the Kenwood TH-25A/45A and the Icom IC-u2A/4A. A UHF version, the FT-811, is on the way. See Ron Fisher's review for photos and other details.

Memories, PLL And Scanning

There are 48 memories, labelled 1 to 48, and a call channel memory labelled C. Memories 47 and 48 are also labelled L and U and serve as lower and upper limits for programmed scan, but are otherwise like the others. All memories can store offset, subaudible tone status (ENCODE or ENCODE/DECODE — with optional FTS-17 tone board). The 411 also has ten separate memories for DTMF code sequences up to 15 digits, which can be transmitted as desired on any operating frequency. The FT-411 has two VFOs (A and B) with independently selectable step size (5, 10, 12.5, 20 or 25 kHz). The 4 x 4 keyboard controls all these functions in a manner that I found user friendly (the Yaesu FT-209/709 did less with a 5 x 4 keyboard). Second functions for all keys are obtained by pressing the bottom right hand key, the "function" key, which then remains active for 5 seconds (this was 3-4 seconds for the FT-209).

The PLL (Phase Locked Loop) of the FT-411 must lock up somewhat faster than that of previous radios, because the scanning and power saver cycle times are somewhat faster. The radio can scan through 20 memories in 3.1 s, or 150 ms per step for any arbitrary sequence of frequencies in the 2m band. When scanning consecutive frequencies (band scan) the FT-411 takes only 70 ms per step. This is FAST.

This speed is reflected in the power saver, which has an "on" time of only 30 ms. The "off" time can be programmed to ten different values between 30 ms and 1000 ms. The FT-209 needed an "on" time of 300 ms. To indicate the consequences of this I show the power-saver performance of both the 411 and the 209 in the table below.

Saver Code	Off Time (ms) FT-209	FT-411	Av. Rx Current (mA) FT-209	FT-411
1	300	30	26.5	23
2	600*	70	20.3	16.2
3	900	100	17.3	13.8
4	1200	200*	15.4	10.4
5	1500	300	14.2	9.1
6	1800	500	13.3	7.9
7	2100	700	12.6	7.4
8	2400	800	12.1	7.2
9	2700	1000	11.7	7.0
0	3000	- 11.4	-	

Note that both radios have a current drain of 40 — 45 mA with saver off — Asterisks show default saver settings. Clearly the FT-411 allows you to use the same or lower average receiver current with much lower probability of missing short calls.

I think Yaesu have missed an opportunity with this fast PLL. Its speed is such that acceptable scan speeds could have been obtained by allowing power saving while scanning. No radio that I know of does this at present — and probably no previous radio had a fast enough PLL to make it feasible. However, you can trick the FT-411 into doing a very slow memory scan, with power saving, by putting it into priority mode while memory scanning. (You could also do this with the FT-209, but with one difference. On the 209, all scanning stopped when an occupied memory was encountered, but the 411 just keeps on scanning in accordance with the selected scan resume mode.)

Scan Modes

The FT-411 will scan through the whole range of the radio in the current VFO steps as set up by the user, or between the upper and lower limits set in memories 47 and 48, in steps determined by the previously selected VFO, or it will scan through all its memories. It is possible to designate memories to be skipped during scanning.

Although it has very little to do with scanning, I might mention here that the 411 allows you to "hide" memories. As far as I can see, this is effectively a procedure for erasing the contents of any memory. However, Yaesu call this hiding because you can recover the data in a given memory location (2 — 48) as long as you haven't overwritten it since erasing (hiding) it.

Scan Resume Modes

There are two user selectable modes labelled P and 5: Pause and 5 seconds. In the "P" mode the radio resumes scanning about 3 seconds after the mute closes. In the "5" mode it resumes scanning after 5 seconds, regardless of mute status.

Transmitter

The FT-411 offers transmit powers of about 2.5 W with 7.2 V (6 NiCad cell) battery packs and 5 W with 12 V (10 cell) battery packs. The measured power output (at 146 MHz), current drain and efficiency, as a function of supply voltage is shown in the table below. The variation between 144 and 148 MHz is negligible.

Supply Voltage (V)	Current (A)	Output Power (W)	Overall Efficiency
5.5	.7	1.35	.35
6	.76	1.68	.37
6.5	.83	1.98	.37
7	.89	.231	.37
7.2	.92	2.45	.37
7.5	.96	2.74	.38
8	1.02	3.12	.38
8.4	1.07	3.44	.38
9	1.14	3.78	.37
9.6	1.20	4.42	.38
10	1.24	4.8	.39
11	1.33	5.3	.36
12	1.38	6.0	.36
13	1.30	6.0	.36
14	1.28	6.0	.33
15	1.27	6.0	.31

The efficiency is good. The radio attains maximum efficiency at quite low voltages (~7.2 V). Clearly there is no

advantage in supplying more than 12 V to this radio. Low power was 0.45 W for a current drain of 0.48 A for all supply voltages between 5.5 and 15 V. The efficiency on low power varies from 0.17 at 5.5 V to 0.06 at 15 V. The LCD power indication shows 5 bars on low power and 12 bars on high power — regardless of the actual power level.

Receiver: 144 to 148 MHz

The receiver uses two bipolar transistors in a single package (labelled 1MX5) as RF amplifier stages preceding a bipolar mixer (2SC3120) feeding the first IF at 17.3 MHz. Local oscillator injection is via the base of the mixer transistor. As noted by Ron Fisher, there are a number of filters preceding the mixer, but these are not so much for 144-148 MHz selectivity as for controlled band pass from 130 — 180 MHz — see the next section.

At 146 MHz I measured a sensitivity of 0.17 μV for 12 dB of quieting and 0.22 uV for 20 dB of quieting. Variation in sensitivity from 144 to 148 MHz is shown below (microvolts input for 12 dB of quieting).

FREQ (MHz)	144	145	146	147	148
SIGNAL (uV)	0.175	0.17	0.17	0.165	0.16

The LCD signal strength meter sensitivity is as follows (number of bars for signal input in microvolts):

NO of BARS	SIGNAL (μV)
1	0.5
2	0.76
3	1.2
4	1.4
5	1.8
6	2.2
7	2.6
8	3
9	3.8
10	4.3
11	5
12	6

No bars are activated when the mute opens, unless the signal strength is 0.5 microvolts or more.

The receiver current without power saver is 42 mA. This rises to 60-70 mA with moderate audio and about 15 mA at maximum audio levels. The quality of the audio from the small speaker is surprisingly good, but not loud enough for comfortable listening in the average small car.

I am not really sure how to measure adjacent channel rejection. With the receiver tuned to 147.000 MHz I found that 1 V RMS signals at 146.975 or 147.025 MHz caused only 1 dB of quieting. This seems very good indeed, but since 1 V is about 140 dB greater than the 0.17 μV sensitivity (for 12 dB of quieting) at 147.000 MHz, it is obviously something different from the 60 dB adjacent channel rejection quoted by Yaesu!

The receiver is very sensitive and gives surprising performance using only the 110 mm "Rubber Ducky" supplied with the radio. However, when connected to a quarter wave aerial on a car, or to a base aerial, the receiver exhibits some overload problems. This is not surprising in view of its sensitivity, the broad front end (see next section) and the simple bipolar mixer with base injection. However, the radio is mostly well behaved with the rubber ducky antenna, which is what it is designed for.

It is probably to be expected that receiver performance might be a casualty in such a small full-featured radio. This being the case, I think the time might be coming when a switchable RF attenuator could be necessary. With a transmit power of 2.5 or 5 W you will drop out long before the signal from a 25 W repeater gets down to 0.17 μV. My guess is that most repeaters don't have sensitivities as good as 0.17 μV, so a 10 dB receiver attenuator would make for more comfortable receiving and improved transmitter-power-limited coverage with an external aerial. The other solution would be an external 144 — 148 MHz cavity or band pass filter to be used between the radio and an external aerial — an excellent homebrew project!

130 — 174 MHz Receiver Coverage

When I first received the FT-411 from DSE it had 144 — 148 MHz transceive capabilities. However, I knew that American models boast 140 — 174 MHz receiver coverage, so I asked Chris Ayres why Australian amateurs could not have this feature as well. The problem was that the modification that gives extended receiver coverage also increases transmitter coverage, to 140 — 150 MHz. After checking with the WIA, Chris Ayres agreed that amateurs wanting the increased coverage could return their FT-411 radios to DSE for modification at no cost. Naturally I asked for the modification to be done on the review unit. It was done overnight, without any clues about how, with the following results.

I should note first that with this modification done, the responsibility for operating within the 144 — 148 MHz band lies with us amateur users. If we are not responsible in this regard we will suffer the consequences!

When I received the modified FT-411 I noticed that the receive coverage actually goes from 130 to 174 MHz, so I decided to measure and graph its sensitivity and image rejection over this range. After a bit of confusion I discovered that the FT-411 actually switches from high-side injection (i.e. local oscillator frequency = dial frequency + intermediate frequency) to low-side injection (LO = dial — IF) as it is tuned from 156.995 MHz to 157.000 MHz. (The first IF frequency is 17.3 MHz). This reduces the range that the VHF VCO, which is in effect the local oscillator, must tune through for the radio to cover the 44 MHz between 130 & 174 MHz. In fact, the full range of the VCO is from 139.7 MHz, required for receiving at 157.00 MHz, to 174.295, required for receiving at 156.995 MHz. By measuring the sensitivity of the radio at dial frequencies between 130 and 174 MHz, and their images, I was in fact able to measure receiver sensitivity from 122.4 MHz (139.7 — 17.3 MHz) to 191.595 MHz (174.295 + 17.3 MHz), as shown in Fig 1. This is a bit confusing so the figure shows three frequency axes — the actual frequency being received, the dial frequency and the VHF VCO (or LO) frequency. Some frequencies can be received for two different dial frequencies, with negligible difference in sensitivity as far as I could see, so you can get confused about what is signal and what is image. For example, the radio receives 165 MHz for dial frequencies of 165 MHz or 130.4 MHz (= 165 — 34.6 MHz). To add to the confusion, note that at some dial frequencies the radio is actually more sensitive at its image. For example, at a dial frequency of 174 MHz the sensitivity is about 24 μV (for 12 dB noise quieting) at 174 MHz or about 0.2 μV at 139.4 MHz (= 174 — 34.6 MHz), an image enhancement of greater than 60 dB!

What does all this mean? As far as I can tell, it means that the front end filters of the FT-411 give the broadest possible band-width without sacrificing performance between 140 and 150 MHz, where the rejection of the image at 174.6 — 184.6 MHz is betwen about 60 dB and 80 dB. This is highly desirable because of the strong TV signals likely to be encountered in the 180 MHz region. Meanwhile, a casualty is that the sensitivity from 165 to 174 MHz is not great. In fact the sensitivity at 174 MHz is quite poor; about 24 μV for 12 dB NQ.

As mentioned above, the sensitivity measured at any frequency accessible on two different dial frequencies was negligibly different on those two dial frequencies. This suggests that the local oscillator injection level is fairly constant over the 139.7 to 174.295 MHz range. The ultimate test of this was to compare the sensitivity at 156.995 MHz (where the LO is 174.295 MHz) with that at 157.000 MHz (where the LO is 139.7 MHz). The

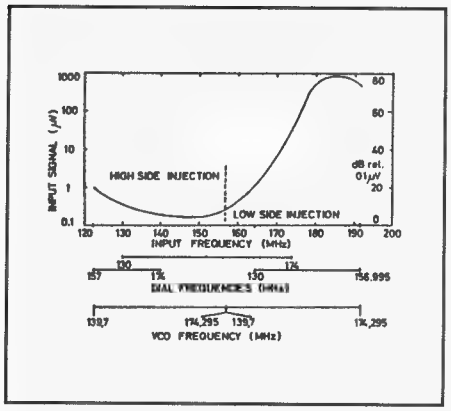

Fig 1 FT-411 Receiver Sensitivity

sensitivities at these two frequencies were 0.23 and 0.26 μV for 12 dB NQ respectively, conforming that there is very little change in the level of the LO as it jumps from 174.295 to 139.7 MHz! This in turn leads me to assert that the curve of Fig 1 reflects largely the bandpass filter characteristic of the front end of the receiver, assuming that the mixer efficiency is constant over the range of frequencies concerned.

Using the radio with a half-wave antenna in my home, I did not notice any gross overload problems. I found that I could hear both sides of many simplex communications in the VHF marine band (156 — 163 MHz) between ferries on Sydney harbour, about 10 — 20 km away. The 25 kHz step size is ideal for the marine band but at higher frequencies (165 — 174 MHz) a 30 kHz step size is desirable. Yaesu please note!

Battery Packs And Size

Yaesu quote the FT-411/811 as being identical in size to the FT-23/73, at 55 mm wide by 32 mm deep by 139 mm high with the FNB-10 (7.2 V, 600 mAh) battery pack. Actually, the FT-411 is supplied with the FNB-14 (7.2 V, 1000 mAh) battery pack, which increases the quoted height to 155 mm. These are not really "overall" dimensions, mostly because of the "power bulge" under the PTT button.

My measured dimensions (in mm) are:

Dimension	FT-23/73	FT-411/811
Main Width	54.5	54.5
Width including PTT	62	62.5
Width inc PTT + Wrist Strap Mount	67.5	67
Depth	32	33
Main Height	75.5	76.5
Height including Knobs	86	87.5
Height of PTT Power Bulge	44	50

Some of the battery packs for the FT-411/811 are bigger than the radio, so a comparison of their sizes and capacities is pertinent. The table below shows a number of their dimensions and a figure of merit proportional to volumetric efficiency, the stored energy in Joules per metre of length. For those who may want to convert these to Joules per unit volume, the cross sectional dimensions of the packs are 55 mm by 32 mm.

Type No.	Length (mm)	Radio & Battery (mm)	V 7.2	Cap (mAh) 200	Figure of Merit (Joules/ Metre)
FBA/FNB-9	46	122	7.2	200	31.3
FBA/FNB-17	51	127	7.2	600	84.7
FBA/FNB-10	63	139	7.2	600	68.6
FNB-11	112	188	12	600	64.3
FNB-12	79	155	12	500	75.9
FNB-14	79	155	7.2	1000	91.1

Note that the FBA type packs are for fitting your own cells. These would be AAA size (180 mAh) for the FBA 9 or AA size (450,500, 600 or 700 mAh) for the FBA 10 and 17. The capacities and figure of merit shown in the table refer to the FNB packs. The FNB-14 supplied with the radio has the best volumetric efficiency, but my choice would be the new FNB-17 because of its smaller size. Both the FNB-14 and the FNB-17 will soon be available from DSE as spare parts, both for $99, so it could be a difficult choice! It wouldn't be worth bothering with the 200 mAh FNB-9, which is almost as big as the FNB-17. However, if Yaesu were to develop a 200 mAh pack with decent volumetric efficiency it would make for a very small package. Another combination that would be interesting would be an FBA-17 with six 700 mAh AA cells — this would have a figure of merit of 98.8 J/m! When the FBA-17 becomes available it will be interesting to see how Yaesu have engineered a 51 mm pack to hold 50 mm long cells but perhaps DSE will come to the rescue with their S-3312 600 mAh cells, which are a little under 49 mm long.

Using the FT-411 with the FNB-14 and FNB-10 packs, I found it fitted into a coat pocket much better with the latter. Also with this pack it compares more than favourably in size with its two main competitors, the Icom IC-μ2A (59 mm x 28 mm x 117 mm with the 120 mAh BP-21 or 146 mm with the 270 mAh BP-22) and the Kenwood TH-25AT (58 mm x 29.5 mm x 137.5 mm with the 600 mAh PB6 battery pack).

Battery Capacity And Charging

It has to be said that the 1000 mAh FNB-14 battery pack supplied with the FT-411 is very good value. On the default battery saver setting the receiver current drain is about 16 mA, giving a useful life of a few days to a week with modest usage. This for me was a new experience — I had to charge the pack only a few times during a period of a few weeks. While I was at it, I measured the charging current from the M-9517 charger supplied with the radio, which plugs into a 2.5 mm phono socket in the side of the FNB-14. (The socket is connected to the battery via a silicon diode, which prevents discharging through the socket — the FNB-10 has the same arrangement.) The charger is a standard DSE catalogue item, for charging NiCad packs from 7.2 V to 12 V. I found that the charging current started at about 200 mA with a flat FNB-14 and dropped to about 120 mA within 1 to 2 hours. The charger is actually a 12 V, 200 mA maximum plug pack with "loose" regulation — i.e. probably a series resistor. Assuming a constant current of 120 mA, I infer a charging time of 1.4 x 1000/120 h or 11.7 h. DSE suggest a charge time of 13 h for the FNB-14 but I found some inconsistencies in the figures quoted for the M-9517 in various places, so I suggest that users who want to charge their batteries optimally should check the charging current. Because of the loose regulation of the charger it seems quite conceivable that the charging current could vary somewhat from one unit to another.

I also checked the capacity of the FNB-14 by discharging it into a 100 ohm load and monitoring its voltage on a chart recorder. On three separate occasions, after varying charge times between about 9 and 12 hours, I measured capacities of 967, 977 and 992 mAh. This is a very satisfactory result and suggests that a charge time somewhat less than 13 hours is perfectly adequate.

Summary

The microsized, full-featured FT-411, with its "1000 mAh is forever" battery pack is a stunning radio. It does come with a soft case (CSC-37), which was not supplied with the unit lent to Ron Fisher for review. The CSC-37 has a clear plastic window over the whole keyboard/display area — much better than the case for the FT-209, which left the keyboard exposed. The illuminated display is quite readable and the keyboard illumination is both beautiful and functional — it only draws 75 mA too! The CTCSS encode/decode/pager option is available ex-stock from DSE for $106, which is about half the price of units for earlier radios — if you could ever get one! As with most keyboard programmable radios the DTMF functions are standard. I can't think of anything else you could want in a 2m handheld!

Thanks to Chris Ayres and Dick Smith Electronics for the extended loan of the review unit, Serial No. 9D0801071 **ar**

DIGITAL PACKET ON VOICE REPEATERS IN THE AMATEUR 2-METRE BAND

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25 LEWIS AVE SEVEN MILE BEACH 7170

The rapid evolution of Digital Communications has resulted in the recent general availability of "Packet" terminal units, which are in use on many Amateur Bands, including those employing repeaters.

Voice traffic repeaters are established on the 144-148 MHz band and are well utilised — recently, the increased presence of Digital traffic on some of these repeaters has led to irritation and ill-feeling from those who are not participating.

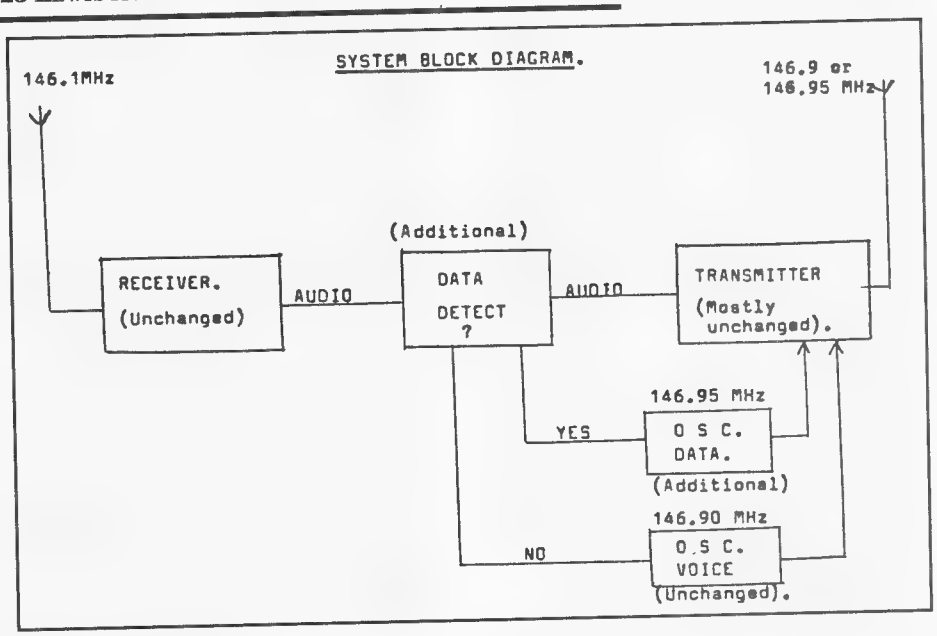
To a "Voice" user, the bursts of Digital Data can be extremely irritating — akin to the effect of "Button-Pushing" often encountered. This is causing considerable friction between users of the two modes; clearly they are incompatible on the same channel.

In approaching the problem, it is important to be positive, recognising the rights and needs of both groups; the following solution is suggested as a possible answer to resolving the conflict, without inflicting the hardship of great expenditure on any group, and conserving the spectrum as effectively as more complex solutions.

Proposal

(1) The voice repeater's receiver would remain on its normal input frequency, say 146.1 MHz.

(2) The audio output of the receiver would be fed to a "Bit-Stream" detector, which would recognise the two tones present in the Packet.



System Block Diagram

(3) On voice, the repeater would work normally, with its input and output frequencies unchanged.

(4) On "Packet" the data detector would switch-in a separate transmit oscillator, which would shift the repeater output freq to, say 146.95 MHz, to re-transmit to packet users, whose receivers would be set to this frequency. Thus, the voice users would hear no annoying tones, and the Packet users would have no voice signals to contend with.

Note

- Only small, comparatively inexpensive modifications.
- No increase in Frequencies over an additional single-channel Repeater — good use of Spectrum.
- The passage of "Opposite Mode" Traffic would be inhibited by the Data Select Logic, preventing mixed transmissions. **ar**

WIA NEWS

Continued from page 6

by the Civil Aviation Authority (CAA) as reported on page 6 of December 1989 issue of Amateur Radio magazine.

At their November meeting, the WIA Executive formally adopted this new bandplan, and the 1296 MHz bandplan shown as Plan B on page 31 of the 1990 Australian Radio Amateur Call Book is now the current amateur service bandplan for that band in Australia.

Sponsors of 1296 MHz repeaters should take note of this plan when seeking repeater licences.

WIA Video Tape Library

Are you aware that every radio club in Australia can provide its members with a quality technical lecture on a wide variety of amateur radio subjects by making use of the WIA Federal Videotape Library.

Tapes can be provided in U-Matic, VHS, Beta and Video 8 formats and, especially for WIA affiliated clubs, this service is inexpensive and easy.

Full details of this excellent facility last appeared on page 38 of the November 1988 issue of Amateur Radio magazine, but will be published again, together with the comprehensive list of available videos, in the February 1990 "Reference" issue of Amateur Radio.

John Ingham, VK5KG, tells me that the latest tapes to be added to the library, which will be of particular interest to experimenters, are "Clem Tilbrook VK5GL on Crystal Grinding" and "Introducing Microwave" presented by Des Clift, VK5ZO.

If you want more information about the Federal Videotape Library, contact your Division. **ar**

WEATHER SATELLITES PART III

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(Continued from October issue)

Early satellites equipped with scanning radiometers produced an image with inherent panoramic distortion, (milk bottle dist). The result of scanning a round body (earth) with a rotating constant speed scanner in space is a picture similar to that produced by wrapping a flat picture or map around a milk bottle then viewing it at arm's length. As the picture curves towards the sides of the bottle the geometric distortion of the image increases rapidly.

Current NOAA and METEOR satellites overcome this geometric distortion by means of electronic linearity correction performed on board the spacecraft before transmission.

APT Weather Facsimile Format - WEFAX

APT SR mode images are pictures transmitted direct from the low polar orbit satellite's scanner in real time.

Geostationary satellites do transmit some real time pictures, but the huge quantity of data in these images is difficult for an amateur station to record and process or display. (4,800 pixels by 4,800 lines = 23 million bits per pix).

The advantages of pictures from geostats are available to small amateur stations, not in real time, but within a period of 30 minutes to an hour, the time required to process the image by computer on the ground into the WEFAX format.

WEFAX pictures are received from a satellite, recorded, processed, enhanced, gridded (lat, long, coastlines), then formatted and retransmitted to a satellite for transmission to APT WEFAX stations. This might not be via the same satellite.

They are low resolution images with a video bandwidth of 1600 Hz, amplitude modulated (white 80%, black 5%) on to a 2400 Hz audio subcarrier. The result (800Hz to 4000 Hz) can be tape recorded for future replay.

The image format is 800 lines of picture, 800 picture elements per line, with a 1 to 1 aspect ratio (square pix). The line rate of 4 Hz (240 rpm) requires 200 seconds per picture. The WEFAX picture begins with three seconds of 300 Hz start tone (square wave), 5 seconds of phasing signal short black pulse (12.5 ms) on a white line (237.5 ms), 800 lines of pix with either 7 cycles of 840 Hz or a narrow white bar as a line start signal, and ends with 5 seconds of 450 Hz stop tone (square wave.)

The WEFAX format is designed for automatic control of facsimile receivers. The index of co-operation is 267.36 (this number relates to the drum diam and stylus leadscrew pitch needed to get a square picture) to give the right aspect ratio.

From 36,000 kms altitude the earth is quite small. It subtends an angle of about 17 degrees. This simplifies the image scanning process, but limits the antenna gain on the satellite if the full hemisphere is to receive the satellite signals (beam width fairly large.)

WEFAX images can be in visible light or infrared and can be computer enhanced to highlight special features of the weather. The DVORAK hurricane curve is the enhancement used to highlight tropical cyclones, with IR the range +2 deg. C to -70 deg. C are highlighted and can be separated from the remainder of the image.

Other curves can be used to enhance ocean water temperature measurements, formation of frost, snow, land temperatures, etc. These are some of the 200 curves available to process satellite images by reinterpreting the grey scales of the picture.

Weather Satellite Receivers VHF

The frequency band 136 to 138 MHz is set aside in most parts of the world for space to earth communications (the German V2 s were the first to use it.)

The band 137-138 is where the APT transmissions take place. This is in Australian TV channel 5A.

The NOAA satellites use two frequencies.

NOAA 10	137.50 MHz	switchable
NOAA 11	137.62 MHz	if in conflict
NOAA 9	137.62 MHz	or test mode

The METEOR series use a number of frequencies; common ones are:

METEOR 2-16	137.4 MHz
METEOR 2-17	137.3 MHz
METEOR 3-2	137.85 MHz

(combination sat/freq current as at February 1989 but subject to change.)

Less common METEOR frequencies used include:

137.06, 137.12, 137.15, 137.33, 137.45, 138.80 MHz.

The VHF APT transmissions from polar orbiting satellites use wide band frequency modulation with no pre-emphasis.

The deviation of the NOAA satellites is +/- 18 kHz.

The maximum modulating freq is 4000 Hz, and the doppler shift +/- 3 kHz.

Allowing 3 kHz for tx and rx freq errors the practical receiver should have an IF bandwidth of 50 kHz.

The METEOR satellites are reported to have a smaller deviation, +/- 10 kHz, and require a receiver IF bandwidth of 30 kHz. But we have seen METEOR S with more deviation than NOAA S.

From this we can see that the IF bandwidth is a problem, since most FM receivers are either narrow 15 kHz bandwidth (comms), or wide 150 kHz bandwidth (FM broadcasting, TV sound).

One of the solutions to this problem is to obtain a crystal filter from an old mobile. When there were less mobile stations about, the channels were wider than in today's crowded spectrum.

The popular scanning receivers are not suited to serious satellite work as the bandwidths are tailored to communications or broadcasting only, and often don't include 136-138 MHz.

A second solution and the one that I favour is the use of a crystal locked converter and a tuneable IF receiver. The old ex army FM transceivers (PLESSEY mobiles B47/48, C45/46 or the USA army type PRC9/10 manpack), covering the range 23-38 MHz or 38-56 MHz are 50 kHz wide and perform well.

Mine have been converted to solid state.

With AOS at typically 3000 km, a path attenuation of 146 dB at 137 MHz and a transmitter power of 5 watts, the receiver should be capable of 20 dB of quieting at 0.5 microvolts. The use of a JFET/MOSFET preamp enables this performance to be reached easily.

The standard 2 metre rig with a converter will allow you to hear the satellites but the limited IF bandwidth will not produce good pictures. Also with a 10.7 MHz IF most two metre rigs have their local oscillator in the range 133.3 to 137.3 MHz complicating the design of the converter.

One advantage of this is that I can use the local oscillator of my IC22S as a signal source to check my satellite receiver. As the sensitivity of the system is improved you park the car with the mobile receiver turned "on" further down the street.

(148 - 10.7 = 137.3 METEOR 2.16).

For the home constructor the following weather satellite receiver kits are available, Aust Electronics Monthly, Germany VHF Comms, USA Hamtronics, UK Cirkits.

We hope to present a local kit in the near future.

The VHF Comms design (boards available from New Zealand) has a scanning local oscillator to help find new satellites or changes of freq, and the use of a phase locked loop detector for best s/n at low signal strengths.

Automatic frequency control of the receiver is a natural next step after scanning. When a signal is heard the scanning stops (controlled by the squelch circuit) and the low pass filtered output of the discriminator is connected to the voltage control of the local oscillator to lock the receiver to the incoming signal. This tracks out the Doppler shift and keeps the signal in the middle of the IF passband.

A time delay in the return to sweeping is desirable so that if the signal is lost due to a fade the picture is not disrupted more often than necessary.

The 137 MHz band is not often affected by the day to day changes in the ionosphere. There are days when the effects do reach 137 MHz.

The most often seen result is a series of slow deep fades produced by multipath signals (the main signal and reflected signal add and subtract). This is normally found on days when six metres is open (a good DX indicator).

On the days when two metres is open, the effect on the picture is to completely shred up the signal. A mixture of deep fades of short duration, and many multiple path signals completely destroy the image.

The use of a post detection audio band pass filter (800 Hz to 4000 Hz) to limit the bandwidth of the recovered video to remove high freq noise is desirable as the FM system has no pre-emphasis (any de-emphasis in the receiver should be removed.)

The video should be extracted before the volume control of the receiver to provide a constant level to the tape recorder or display device.

The use of an automatic gain control on the video to compensate for the different satellite's FM deviation is not as desirable as it may seem. It tends to produce flatter pictures due to the reduced dynamic contrast range, and also produces long term streaking on the picture background. Automatic recording level control used in some tape recorders will also produce this effect.

The predictable pass times, stable low signal strengths, and the wide bandwidth of APT satellite signals offer the amateur a good source of signals for experimentation with antenna design, low noise preamps, receiver designs, more exotic types of FM detectors, phase locked loops, synchronous detectors, extended threshold demodulators, FM bandwidth compression techniques, or squelch circuits, without the need for expensive or hard to get test equipment.

One of the dilemmas facing the builder of a weather satellite receiver is the choice of local oscillator type. The multitude of frequencies makes the use of crystal oscillators an expensive business, unless the builder has a good junk box.

The frequency range to be covered (137 to 138 MHz) is about five times too wide to be covered by the use of a variable xtal oscillator (VXO).

The simple frequency synthesizer circuits now possible thanks to the use of large scale integration (LSI) and emitter couple logic (ECL) combined with a read only memory (ROM) chip are a practical alternative, with the advantages of quick freq change (scanning) with precise frequency control.

A crystal converter and a tuneable first intermediate frequency of about 30 or 40 MHz will provide the frequency stability necessary over the one MHz tuning range.

The last option is the voltage controlled oscillator. Its inherent frequency drift problems can be overcome by the use of automatic frequency control (AFC), and a low frequency sawtooth voltage to sweep the oscillator over the band as it searches for a signal to lock on to.

WEFAX Super High Frequency Receivers

The design and home construction of a 1691 MHz receiving system to produce pictures from a signal of -134 dBm or 0.044 microvolts on 50 ohms seems daunting at the first look (and possibly the second look as well). When it is up and running you have a sense of achievement, and plans for the next version firmly in place.

The geostationary satellite that provides coverage of Australia, is the Japanese GMS 3. Its specifications differ from GOES and METEORSAT in FM deviation. The GOES and METEORSAT both use +/- 9 kHz deviation and require an IF bandwidth of 26 kHz.

The GMS satellite uses +/- 126 kHz deviation, and needs an IF bandwidth of 260 kHz. The bandwidth being 10 times wider receives 10 dB more noise.

This means that we cannot use overseas designs unless we redesign to provide the wider IF bandwidth and lower noise performance required. To produce a usable signal we require a larger antenna to compensate or a lower noise figure in the receiver, or both.

To obtain a reasonable noise figure a special low noise bipolar transistor can provide 1.5 - 2 dB NF. The use of a GaAsFET can lower this to 1 dB NF or less.

Due to the loss in coaxial cable at 1691 MHz most WEFAX receivers are mounted on the back of the parabolic dish and fed via a short length of large low loss cable from the antenna preamp mounted on the dish feed. The power feed for the preamp can be fed up the centre conductor of the coax.

A common system used overseas is to use a crystal locked converter on the dish and feed an IF typically 137 MHz back to the stations VHF APT receiver; this is not satisfactory with GMS, as the APT receiver bandwidth is too narrow (by a factor of 10.)

The antenna required for the SHF receiving system must bridge the gap between the flux density of the satellite signal -134 dBm and the performance of the receiver -107 dBm.

The difference of 27 dB or 500 times must be made up by the antenna. At 1691 MHz this requires a parabolic dish of at least 2.5 metres diameter.

The use of a low noise preamplifier mounted on the feed of the dish can provide a reserve of gain to make up for losses like the feedline and connector losses. (2.5 metres of RG 213 has about 3 dB loss. Without the preamp this loss would be added to the NF of the receiver.)

The SHF radio frequency part of the receiver can be either tuned cavity resonators, air spaced transmission lines, (low loss) printed circuit stripline, or interdigital filter construction.

The bipolar transistor (NEC) NE6435 used in a typical low noise amplifier (LNA) circuit has the emitter directly grounded (for stability) and requires careful bias adjustment to ensure the lowest noise

figure possible.

GaAsFETS (MIT) MGF1402 or MGF1200 can provide a better noise figure but again the bias adjustment is critical if the devices are to meet expectations.

The input matching in the LNA is the most critical circuit, the Q of this circuit must be as high as possible as its losses degrade the amplifier NF.

The local oscillator chain should be crystal controlled, as the highest practical xtal oscillator freq typically 100 MHz (5th overtone) will have to be multiplied by 15 to produce the local oscillator frequency for the conversion to 137 MHz.

If the xtal is subjected to temperature change and its frequency drifts 1 kHz (at the 20 MHz fundamental frequency) the injection freq shifts 75 kHz as does the IF, so care is required in design and construction for freq/temperature stability.

The low noise preamp at the focus of the dish can also be subjected to large temperature extremes. Don't paint your dish high gloss white or silver unless you want to cook your prized LNA.

Waterproofing of connectors, cables, LNA and receiver are important when you have only a small carrier to noise ration in your system, as every dB counts.

A source of SHF signal is handy when building low-noise amps, converters and receivers. A well shielded, small xtal oscillator on a sub multiple of 1691 MHz, modulated and multiplied provides a stable low level signal for alignment.

When the SHF receiving system is up and running the oscillator can be hung up in the shack with a small ground plane antenna (4.5 cm) as a talking point. The SHF beacon signal may save you dismembering your system the first day the satellite fails to show on time.

An alternative source of alignment is your station's 6 metre rig tuned to 52.84375 MHz. The transmitter's 32nd harmonic should be audible.

Kits for LNAs and SHF converters and receivers are available from Germany (VHF Comms) and the USA (Microcomm Inc).

Most amateur WEFAX stations are home constructed and designed.

Antenna System for Weather Satellites VHF

The VHF APT signals from the polar orbiting satellites are of sufficient signal strength that they can be heard on a simple quarter wave vertical with a ground plane.

The serious weather satellite watcher will soon want something better. There are two antenna types - the low gain omnidirectional, and the higher gain directional.

The high gain directional antenna, because it is directional, must track the satellite as it moves across the sky. A computer can supply data for azimuth/elevation control system.

The antenna, a Yagi/Uda or helical, should provide circular polarization to match the satellite's right hand circular transmissions.

Unless you have a motorized az/el mount and a computer, both looking for a job, the degree of complication and expense of such a system is not justified.

The combination of a low gain omnidirectional antenna with a good low noise preamplifier mounted at the mast head will produce good quality pictures from horizon to horizon. Two antennas used in this way are the half wave vertical J-pole antenna, and the turnstile or crossed dipoles with reflectors (wide spaced) pointed straight up. Crossed dipoles fed in quadrature produce circular polarization so this antenna must be built carefully to match the satellites right hand circular signal. Only the NOAA series seem to be rhc, the METEOR series appear to be linear or plane polarization.

When linear polarization is received on a circular polarized antenna the maximum loss is 3 dB, compared with the correct polarization (vert or horiz.) If the satellite is rhc and the ground station lhc, the loss can be as high as 20 to 30 dB.

Switchable polarization is an advantage on the rare occasions when the signal from the satellite changes polarization on the way down through the ionosphere. This phenomenon normally only lasts for a few seconds to a minute or two.

Super High Frequency Antenna Systems for Weather Satellites

The parabolic dish is the only practical antenna for serious S band weather satellite watchers. This is because of the high antenna gain required to produce a satisfactory carrier to noise ratio at the input to the receiver.

The diameter of the dish determines the gain,

Diameter (metres)	Gain (dBi at 1690 MHz)	
0.6	18	(2ft diam)
1.2	24	(4ft)
1.5	26	(5ft)
1.8	27.5	(6ft)
2.0	29	(6.5ft)
2.4	30	(8ft)
3.0	32	(10ft)

The first step when designing an S band receiving system is to examine the technical specifications of the satellite signal, the nominal radiated power (erp transmitter power and spacecraft antenna gain) and the free space path loss at the freq (1691 MHz). This gives the expected signal power on the ground.

Typical spacecraft transmitters run 5 watts or +37 dBm limited by solar power budget and solid state transmitter power amps. The spacecraft size at launch and the beamwidth to provide full earth disc cover by the antenna, limit the spacecraft antenna gain to 17 dBi (dish 0.6 metres) resulting in an EIRP about +54dBm.

The path loss $L=32.4\ dB + 20 \log_{10} (DF)$

where D equals the path in km, 35,800 km (altitude, the actual path slope range will be longer) and F equals the freq 1691 MHz.This gives a path loss approx 188 dB.

With +54 dBm -188 dB loss the signal on the ground is -134 dBm nominal or 0.044 microvolts on 50 ohms.

The next step is to determine your expected receiver performance based on noise factor and bandwidth. If we assume a noise figure for the system (preamp, cables and receiver) of 3.5 dB and the 200 kHz needed for the GMS 3 satellite we get the answer.

Thermal noise level = 174 dBm + 10 $\log_{10}$ (BW) + 10 $\log_{10}$ (NF) where BW equals receiver bandwidth 200 kHz, and NF equals the NOISE FACTOR (2.2) not FIGURE (3.5 dB).

The result of this calculation gives a receiver threshold of -117.5 dBm or 0.3 microvolts. Not bad, except the signal we want is -134 dBm or 16.5 dB below the front end noise of our receiver.

(0 dBm = 1 milliwatt in 50 ohms)

So now we know the importance of antenna gain. With a 0.6 metre dish the satellite signal should equal the receiver noise. With a 1.8m diam dish the signal will exceed the noise by 10 dB (if you have not fudged your NF estimate.)

I chose a 2.4 metre (8ft dish) to give me a few extra dB of carrier to noise ratio.

There has been a number of magazine articles on SHF loop yagi antenna designs for weather satellite receiving systems. They are designed for METEORSAT or GOES systems. The IF bandwidth of those systems is 30 kHz, which gives an 8.25 dB improvement in receiver performance allowing a quad stack of loop yagis to be used. The GMS 3 wide bandwidth signal is audible on loop yagis, but the signal to noise ratio is not satisfactory for good pictures.

New parabolic dishes are very expensive. When one is upgraded the old one has little value other than as scrap metal and is normally disposed of as such. The value depends on size, weight, location (they are heavy, awkward, and if the

other side of the black stump, of little interest.)

Telecom, TV stations, antenna manufacturers, are possible sources (starting prices $50 up) slightly damaged, dented dishes are a good buy if you are able to panel beat out the dents to less than 1/10 wavelength at 1691 MHz (1.7 cm).

Home construction is quite feasible with several different types. The simplest form is the stressed rib form like a beach umbrella covered with wire mesh (1 cm sq.) Segmented sheet metal construction pop rivetted together is a possibility. Fibreglass with wire mesh formed on a sand mould is also popular. All forms of construction are well documented (see bibliography.)

It is most unlikely that the feed or launcher will be on the dish if you buy one, and even less likely that it will be of any use to you if it is, except to provide one important piece of data, the focal length from the dish to the feed point. The gain specified for a parabolic dish is based on the assumption that the dish and the feed horn are matched to each other. This means that the signal radiated by the feed fully illuminates the dish but does not spill over outside the dish (the beamwidth of the feed at the - 10 dB points subtends the same angle as the dish seen from the focal point.)

If this feed angle is correct for transmitting, then the feed is optimum for receiving. If the dish has no feed then the focal length must be calculated as the first step in the design process. F = (diameter squared) divided by (sixteen times the sagitta), where F = focal length and S the sagitta (depth of the dish.)

We can now calculate the second step, and find the F to D ratio. This figure will allow us to select the feed type to match the dish shape. The optimum F to D ratios range from 0.5 to 0.8. With F/D 0.5 the feed needs a beamwidth of 60 deg at -3 dB points (120 deg - 10 dB points) to illuminate the dish fully. With F/D 0.8 the feed beamwidth required is 40 deg at -3 dB.

The next step is to design a feed with the required beam width to suit your dish. Too wide or too narrow a beamwidth will cause a loss of gain.) Home constructed dishes with F/D of 0.56 can be fed with a simple circular wave guide feed the size and shape of a large coffee tin (12cm diam 18cm long made of brass so it won't rust) containing a 1/4 wavelength (3cm) monopole antenna spaced 3cm from the back of the feed.

The feed must be placed so the focal point of the dish is inside the mouth of the feed which is then adjusted in/out for maximum signal. Then the feed is rotated to line up with the satellite signal polarization (maximum signal). The need to offset the polarization of the feed to suit the satellite is because if, for example, it is horizontal at the equator, then if the receiving antenna is located at say 27 degrees south, the horizon of this station will be at an angle of 27 degrees to the reference horizon (at the equator.) The beamwidth of the whole antenna system is dependent on the gain. With 30 dB gain the -3 dB point beamwidth is 5 degrees. You must aim to +/- 1 degree.

This is no problem with a geostationary satellite as they keep station +/– 0.5 degs or better.

But tracking a fast moving polar orbiting satellite around the sky with a five degree beamwidth antenna is a whole new ball game!

Display Devices for Weather Satellite Pictures

There are three common methods used to display weather satellite pictures:

1. Slow Scan Cathode Ray Tube Monitors.
2. Direct-Printing Facsimile Systems.
3. Digital Scan Converters.

The first method uses a cathode ray tube or TV tube to convert the electrical signals into visible light, here we run into a real problem. With normal television, each picture is completed in 1/25th of a second and as the eye can retain an image for 1/20th second or longer we see a complete picture on the screen. When it takes 1/2 second (120rpm) or 1/4 second (240rpm) to scan each line of picture, and up to 14 minutes of picture on a full overhead pass from a polar orbiter, the picture on the screen seen by the eye is a small dot of varying intensity as it scans across the screen two or four times per second.

Even with a long persistence phosphor (P7) tube, the trace stored on the phosphor only last a few seconds, so it is not possible to see much of the picture. The quick solution to this problem is to photograph the CRT trace for the duration of the picture, the film stores each line of the picture as it is scanned, on development the whole picture can be seen.

The chief drawbacks of photography are the cost, particularly if you opt for the convenience of the instant (Polaroid) pictures approach. Or the time delay if you settle for the less expensive 35mm roll film system. If you take several pix a day, by the time the film has been exposed, developed and printed the first pictures are a week old.

So, while a CRT display and photographic system can produce excellent results with a simple electronic system the photographic costs, and the processing delays are significant penalties.

Direct-Printing Facsimile

The second device, the direct-printing facsimile machine, is expensive to purchase new, and rare on the surplus market. Home construction is possible, even without an extensive workshop. There are several simple designs able to be built with hand tools that produce excellent pictures much cheaper than photographic means and in real time.

The basic FAX machine is a mixture of electronic and mechanical components, it consists of a drum rotated by a motor at the line rate of the satellite, 120 rpm or 240 rpm. The drum speed must be constant so a synchronous ac motor driven by a xtal clock, divider chain and power amplifier is used. Driving the motor from the mains is not practical due to the short time variations in the frequency of the power generation system. The drum is covered with an electrically sensitive, conductive paper, metal coated, or chemically impregnated (Fax paper, depth sounder paper) which is grounded by the metal drum.

A metal stylus of fine steel wire resting lightly on the paper on the drum is fed with amplified video. Approx 240 volts p/p

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through a current limiting resistor will produce black on the paper. Reducing the voltage to less than approx 20 volts will leave the paper white, and voltages between 240 and 20 produce various shades of grey. The stylus is moved slowly along the drum as it rotates, tracing a long spiral around the drum. The stylus feed is a long leadscrew driven by gears from the drum, or by a second synchronous motor. The drum diameter, the pitch of the lead screw, the motor rpm, must be carefully selected to give a magic number called The Index of Cooperation.

For WEFAX pictures the IOC should be 267.36. (The index number represents the product of the drum diam and the number of lines scanned in the unit of measurement used.)

Applying the above, a 50mm diam drum means the stylus must draw 5.347 lines/mm. At 240 rpm the drum takes 1/4 second to draw one line. The stylus must traverse 1mm along the drum in 1.33 seconds. In 200 seconds, it will move 150.3mm, so a drum circumference 157mm and the line 20/21 of that or 149.6mm long gives an aspect ration almost 1:1. If the IOC is not correct, the picture aspect ratio (1:1 for WEFAX) will not be correct - either the picture instead of being square will be long and narrow, or it will be short and wide, and your cyclones will not be round either.

Commercial FAX machines may not run at the correct RPM for satellite pictures and the IOC may not be correct either, so care is required before you rush out and buy that bargain.

The power amplifiers used to drive the synchronous motors and the stylus produce voltages that are dangerous, so suitable care in design and the use of interlocks on covers should be considered.

A well built FAX machine is capable of producing over 800 picture elements per line with 800 lines per pix giving a picture of 640,000 elements. (Compared with a good quality television picture of only 247,825 elements.)

Digital Scan Converters

A Digital Scan Converter collects the incoming picture from the satellite receiver, and converts it into a fast scan television picture for display on a normal TV set or video monitor. The basic scan converter consists of an analog to digital converter (ADC), a write control circuit, a read/write memory (RAM), a read control circuit, a digital to analog converter (DAC), and a television waveform generator.

In a typical digital scan converter, the incoming audio subcarrier, 2400 Hz (+/- 1600 Hz video sidebands) is filtered to remove both low and high frequency noise, then rectified to recover the video signal waveform (varying from black to white or hot to cold) which makes up the image. The video waveform is sampled 256 times each line (in a half or a quarter of a second) by a FET sample and hold circuit and fed into an analog to digital converter chip where the analog voltages become six bit digital words. These are written into a 64 kb dynamic memory and stored (depending on the selected mode the memory may take from 2 minutes to 12 minutes to fully load the picture.)

When the picture is stored in memory, it is then read by the read control circuit at the rate of 256 (six bit) words every 52 microseconds, or a complete picture every 50th of a second. The six bit words are fed into a high speed digital to analog converter to reconstruct the video waveform. With sync pulses added it is now formatted into a fast scan television picture. A picture of 256 pixels/line with 256 lines of information (6 bit words provide 64 steps of grey scale) is available with 64 k by 6 bits of memory.

To improve the picture quality to 512 pixels x 512 lines would increase the memory requirements by a factor of four to 256 k by 6 bits. This would then require a high resolution monitor to view the non-standard television picture produced. It is quite possible to equip the scan converter with say 640 k of memory and load up 10 pictures, and then scan the read control circuit from page to page to show a moving picture of the cloud pattern changes over a period of time.

The use of a UART or similar chip makes it possible to download or upload the contents of the memory to a disk drive for storage, and future reloading in a fraction of the original time (20 seconds).

Scan converters can be dedicated hardware devices eg: the VHF Comms design, a dedicated hardware/software microprocessor controlled device or resident in software in a home computer. At present, programs are available for AMIGA, IBM, C64, and Tandy Coco computers. The quality of the reproduced image varies depending on the graphics ability of the host computer and varies from brilliant to interesting (as do the prices of the software, $20 to $2500.) One drawback with the use of your PC for satellite pictures is that it is tied up for a lot of the time displaying pictures when it should be earning its keep on more important tasks.

Computer Programs for Satellite Tracking

The use of home computers to provide tracking information on weather satellites has been one of the big advances in amateur satellite experimentation during the last ten years. In 1979, Sat Trak International introduced a series of four program for the Apple, TRS 80, and the Sorcerer, which used the NASA supplied two line data set of orbital parameters to calculate and predict satellite passes. Sat Trak was intended for visual as well as radio observations, and although a little slow, soon made the traditional plotting board and tracking diagram obsolete, at least for the satellites for which data was available.

The AMSAT Phase III spacecraft project required a number of ground command stations. The AMSAT president Dr Tom Clark W3IWI, a professional astronomer by trade, was responsible for the development of the software to provide reliable and accurate azimuth, elevation and Doppler predictions. The resulting software and documentation, published in ORBIT magazine March '81, has become the definitive work on satellite tracking, translated to all the common computers. It was written in North Star BASIC and contained the best features of many of the existing programs from all over the world. The W3IWI software became the basis for many "new" programs. The next step in development was the plotting of the track on a map of the world (a feature of the original Sat Trak prog "trak" but now in multi colour.)

The next development was the addition of the satellite footprint, a circle showing the area visible from the satellite. Like they say on VHF, "If you can't see it, you can't work it". At VHF the signal is almost line of sight as little refraction is noted.

The goal of Tom Clark W3IWI with his BASIC ORBIT program was an accuracy of 10 km with orbits of 40,000 km. This requires regular updates of the orbital elements.

Most satellite tracking programs require a minimum of six primary elements. The classical Keplerian Element set are:

(1) Inclination
(2) Eccentricity
(3) Argument of Perigee
(4) Right Ascension of Ascending Node
(5) Mean anomaly
(6) Semi-Major Axis or Mean Motion

The exact time at which the Keplerian element set describes the orbit is called the Epoch (year, month, day, hour, min, seconds to six decimal places.)

With satellites in simple polar orbits, the need to change orbital elements is greatly reduced and updating every three months is normally adequate (unless solar

activity is high or the orbit is rather low, like Oscar 9.)

When an unidentified satellite is heard, a different program is required, an example is ASCOT (Any Satellite Circular Orbit Tracking) by John Branegan GM4IHJ. This allows an educated guess to be compared with actual reception times and then rapidly narrowed down to a respectable figure.

Weather Facsimile on IBM PC Clones

The September 1988 edition of the ARRL publication QEX contains construction details of a false colour weather facsimile display board for IBM PC or clones by Paul Shuch N6TX. The design of the card follows standard practice and would make a good starting point for anyone designing a computer based display.

After video bandwidth limiting, automatic level control, full wave rectification, and residual subcarrier filtering, an analog to digital converter digitizes the image into a string of 8 bit words (256 level) which are written on command into the computer memory for storage, processing and display under software control.

Elmer Schwittek K2LAF has written a number of programs for the IBM PC to display HF weather facsimile, REAL TIME BAS, WEFAX BAS, MAGNIFY BAS, were some of his early contributions on the subject. His new MULTIFAX EXE software is available in two versions: Version MF 2.1 is for PC with CGA card and provides 4 colours, Version MF 3.0 for EGA card provides 4, 8 or 16 colours. Unfortunately MULTIFAX is not monochrome compatible with MDA or HGA cards. The board described fits inside the PC and requires only the 2400 Hz AM subcarrier from the WEFAX SHF receiver.

The FAXBOARD is not available commercially, but with only 5 IC it should not be difficult for a radio amateur to construct given the design data.

There is no indication of the suitability of the software for APT pictures from polar orbiting satellites, but given the similarity of the received data this should present no difficulty. At present the software uses only a fraction of the stored data, so future versions to utilize the data more fully can be expected, including local version of the board and software.

References:

ARRL Publication QEX, September 1988 : A Weather Facsimile Display Board for the IBM PC, by Paul Shuch N6TX.

ARRL Publication QST, June 1985 : WEFAX Pictures on Your IBM PC, by Elmer Schwittek K2LAF.

ARRL Publication QST, December 1986 : HF WEFAX on the IBM PC, by Elmer Schwittek K2LAF.

For more information contact the Queensland WEASAT Group, c/- VK4ZBV.

Glossary of Terms Related to Satellites

Anomalistic Period: The time between successive passes through perigee.

AOS (Acquisition of Satellite / Signal): The time when the satellite comes above the horizon, or the signal is first received depending on whether you are a visual or radio observer.

Apogee: The point in the orbit when the satellite is farthest from the centre of the earth (apoapsis).

Argument of Perigee: The geocentric angle between perigee and the equator crossing on the ascending node.

Ascending Node: The point on the equator where the satellite crosses the equator into the northern hemisphere.

Attitude: The position of the axis of the satellite related to some other fixed reference coordinates (eg: the orbital plane.)

Azimuth: A bearing (horizontal) relative to true north or other specified reference.

Bulge of the Earth: Difference between equatorial and polar radii of the earth.

Celestial: Prefix to designate lines or points projected onto the celestial sphere.

Celestial Sphere: An imaginary sphere of infinite radius centred on the earth's centre.

Descending Node: The point on the equator where the satellite crosses the equator into the southern hemisphere.

Direct Orbit: An orbit with inclination between 0 deg and 90 deg (prograde orbit.)

Doppler Shift: To a stationary observer the frequency of a moving radio transmitter varies with the transmitter's velocity. When a satellite is moving towards an observer its transmitter frequency will shift high, decrease to normal at TCA and shift low in frequency as the satellite speeds away.

Eccentricity: The shape of the orbit. A true circular orbit has zero eccentricity. Eccentricity is dimensionless, a flat ellipse tends towards one.

Elevation: The angle between the horizontal and a line from the observer to the satellite.

Epoch: The time at which the measurement of the satellite parameters was made.

Equator Crossing (EQX): The point on the equator where the satellite crosses

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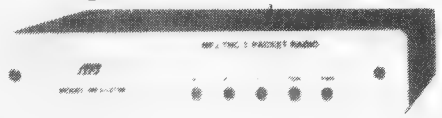

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into the northern hemisphere is quoted in degrees WEST longitude.

Equatorial Orbit: Orbit with zero degrees inclination.

First Point of Aries: The Astronomer's reference point in the constellation of ARIES. (see Right Ascension of the Ascending Node).

Footprint: The area of the earth visible from the satellite, or the area covered by the satellite's antenna.

Geostationary / Geosynchronous: A satellite in a west-to-east orbit of the earth at an altitude of 35,870 km. At this altitude it circles the axis of the earth once in 24 hours (its orbit is synchronous with the earth below.)

Graveyard: Two points on the geostationary orbit path at subsatellite longitudes of 105 deg W and 75 deg W where unconstrained geostationary satellites collect due to the earth being an oblate spheroid. (see oblate spheroid).

Greenwich Meridian: An imaginary line from pole to pole that passes through the observatory at Greenwich (near London) where it is represented by a brass strip approx 1/4 inch wide across the forecourt marking the zero meridian. (Satellite calculations are based on degrees WEST from the Greenwich Meridian.)

Greenwich Mean Time, GMT (ZULU Time): Now replaced with UTC (See UTC).

Great Circle Geometry: The spherical trigonometry used to calculate the bearing and distance between two points on the earth's surface.

Gregorian Calendar: The civil calendar introduced by Pope Gregory 13th in 1582 deleted the accumulated error of 11 days caused by the Julian calendar having a year eleven minutes ten seconds too long. It was introduced to the English in 1752.

Half Great Circle Angle: The angle between a line from the observer to the centre of the earth and a line from the satellite to the centre of the earth (used in satellite programs.)

Inclination: The angle between the plane of the satellite orbit and the equatorial plane. An inclination of 0 to 90 degrees produces prograde orbit. An inclination of 90 to 180 degrees is called a retrograde orbit.

Increment: The difference in degrees between the equator crossings at the start and end of one orbit (approx equal to the earth's rotation in one orbit period.)

Julian Days / Dates: The solar calendar used by astronomers, introduced by Julius Caesar in 46 BC based on the ancient Egyptian calendar with 365 days and 6 hours each year for three years and 366 days every fourth year. A Julian day starts at noon (UTC) - noon on 31st December 1899 was the start of Julian day 2415020. A quick calculation gives us 00:00:00 hrs UTC on January 1985 as Julian date 2446066.5 (the decimal fraction of a day indicates the time.)

Keplerian Elements: The name given to a set of parameters describing the orbit of a satellite in honour of the German astronomer and mathematician Johannes Kepler (1571-1630) who derived the mathematical description of elliptical orbits from his study of the planets and the sun, described in his best sellers, Astronomia Nova (1609) and De Harmonice Mundi (1619.)

Keplerian Element Set: The eight parameters describing a satellite's orbit, Epoch, Inclination, RAAN, Eccentricity, Arg of Perigee, Mean Anomaly, Mean Motion, Semi Major Axis.

Latitude: Latitude is measured in degrees of arc north or south from the equator. Lines of constant latitude run east/west and are parallels.

Longitude: Longitude is measure in degrees of arc east or west of the prime (Greenwich) meridian, (meridians are lines of constant longitude from pole to pole.)

LOS (Loss of Satellite / Signal): The time when the satellite goes below the horizon, optical or radio.

Mean Anomaly: Describes how far around the orbit from the Perigee the satellite was at Epoch. Normally in degrees (0-360), it can be given as a decimal part of one orbit (0-1), or as phase based on 0 to 256. (A concession to binary counters and computers with a modulo 256 software clock.)

Mean Motion: The number of orbits per day through perigee.

Molniya Orbit: A highly elliptical orbit used by Russian comsats, apogee of 40,000 km and perigee of 500 km gives an orbit period of 11 to 12 hours suited to high latitude communications. With 3 satellites following in the same orbit 24 hour coverage can be provided to the whole USSR (comms & TV broadcasts.)

Oblate Spheroid: A rude term used by astronomers to describe the earth, it means squashed, flattened at the poles, and bulging at the equator. The effect of this is to produce graveyards (see *graveyards*). The flattening is calculated at about one part in 298.2 giving an equatorial radius = 3963.18 vs polar radius = 3949.89, a difference of 13.2 miles.

Orbit: One complete circuit of the earth from EQX to EQX, or Perigee to Perigee. They are different, leading to the confusion of two different orbital periods.

Orbital Elements see *Keplerian Elements:*

Perigee: The point on the orbit where the satellite is closest to the centre of the earth, usually defined as Arg of Perigee in orbital elements.

Perigee Rate: The rate of change of the argument of perigee (degrees per day.)

Precession Rate: The angular change of the orbital plane relative to fixed space reference (+/- degrees per day, see *sun synchronous*).

Period: The time to complete one revolution on the earth. Nodal period is the time from EQX to EQX. Anomalistic period is the time from Perigee to Perigee. (They are different, for EQX progs use nodal. With Keplerian elements the reciprocal of Mean Motion equals Anomalistic period.)

Right Ascension: The arc measured eastward, along the celestial equator, from the Vernal Equinox to the great circle passing through the celestial poles, and the object projected onto the celestial sphere (given in hours and minutes 24 hours = 36 deg.)

Right Ascension of the Ascending Node (RAAN): The Keplerian element RAAN is the angle between the First Point of Aries and the ascending node equator crossing, this relates the orbital plane of the satellite with respect to the stars for calculations of perturbations.

Retrograde Orbit: One with inclination between 90 to 180 degrees.

Revolution (REV): The number of revolutions (orbits) from launch.

Semi Major Axis: One half of the major axis from apogee to perigee. (Not normally supplied as an element; it is calculated from the mean motion.)

Sidereal Time: STAR time differs from SOLAR time due to the approx 366 rotations of the sun/earth axis every year of 365 days. The sidereal day is 365/366 solar days or about four minutes per day shorter. This gives a correction factor of 1.0027379093 to which must be added a year factor from the Nautical Almanac. Programs that use Keplerian elements (star based) must use sidereal time.

Satellite in Eclipse: A satellite is in eclipse when the earth prevents sunlight from reaching it. For geostationary satellites the eclipses start 23 days before the equinox and end 23 days after the equinox. Loss of power from the solar array lasts from a few minutes up to one hour maximum and the satellite runs on its batteries.

Solar Time: See *UTC* for details.

Sun Transit Outage: This loss of signal is caused when the sun passes directly behind the satellite as seen by the ground station antenna. The radio frequency output of the sun completely overrides the satellite signal. (The outage can be predicted and lasts up to 10 min-

utes on several days each year.)

Subsatellite Point: The point on the earth's surface intersected by a line from the satellite to the centre of the earth, also called the Nadir.

Sun-Synchronous Orbit: Nominally a retrograde, quasi-polar orbit such that the satellite crosses the equator on the ascending node always at the same local (solar) time.

Time of Closest Approach (TCA): Time when the doppler shift on a signal from a satellite passes through zero.

Universal Time (UTC): The Standard Time for space operations, scientific and engineering purposes is universal time. It is essentially mean solar time at the Greenwich Observatory near London, England.

Van Allen Belt: A band of intense radiation caused by charged particles trapped in the earth's magnetic field (the charged particles result from cosmic rays entering the atmosphere). The term intense means GM counts avg 20/sec at 100 miles to 25,000/s at 2,500 miles, dropping off at 3,500 miles. Radiation levels are so intense that they pose a serious risk to satellite electronic components, as well as any crew manning the craft. The belt is most intense over the equator and minimum over the poles.

Bibliography:

The following list of references (by no means complete) provides a good selection of information on the subject of weather satellites. Some of the references are now of historical importance only. Due to the changes in technology, the designs may be dated but the basic principles are as sound now as they were then.

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Printing Pix from your Weather Geostat Sat (G. Emiliani, M. Righini), Apr 81.

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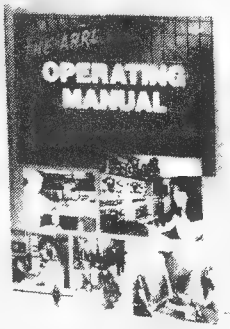

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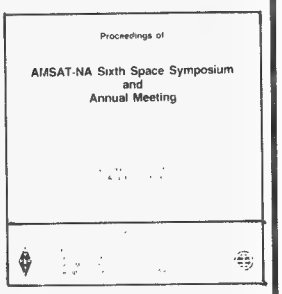

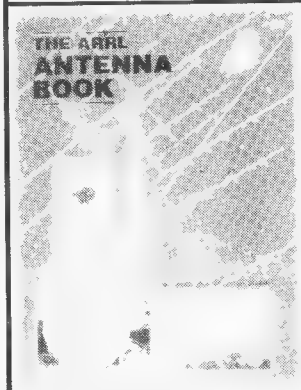

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The VIP:A VIC Image Processor (G. Zehr), Aug 85.

73 Publication. The Weather Satellite Handbook (R.E. Taggart) 4th Edition.

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Calc of Elev/Azimuth for Meteorsat (Lentz) No. 3/78.

More Details on Reception of Meteorsat (Lentz) No. 4/78.

A System for Reception and Display of Meteorsat Images (Tellert)

part 1 Concept and Parabolic Antenna No. 3/79 part 2 Meteorsat converter VHF receiver No. 4/79

part 3 VHF Receiver Image processing No. 1/80.

part 4 Image Proce, Power supply and Motor Amp No. 2/80

part 5 Video board, Stylus driver No. 3/80

part 6 Stop start logic, drum oscillator No. 4/80

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part 9 CRT X and Y amps and EHT supply No. 3/81

A Simple Weather Sat converter for use with 2 meter FM Receivers No. 4/80

Antennas for Reception of orbiting Weather Sats 137 MHz No. 4/81

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A Receive Converter for the GEOSATS, METEORSAT-GOES-GMS (Roble)

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A Digital Storage and Scan Converter for Weather Sat Pix (Vidmar)

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Preliminary Experience with Digital Storage Module No. 2/83

A 2400Hz Generator for sync of METEOR Satellites (Editors) No. 1/84

The GOES Series of Geostationary Weather Satellites (Brittan) No. 2/84

A Low Noise METEORSAT Converter with GaAs-FET Preamp and Mixer (Bartkowiak) No. 1/85

A Digital Multiple Image Storage for Weather Sat Images (Hufenbecher - Store up to 10 pix in memory) No. 1/85

Colour Module with Composite Output for Weather Sat Images (Editors) Mods to Synthetic Colour Board No. 1/85

FM/AM Converter for Facsimile Reception and Picture Display with the YU3UMV Picture Store (Knoeff) No. 3/85

Digital PIX Storage for SSTV, FAX and WEFAX (Schroeter, Driesche) (Single board version of YU3UMV Scan Conv) No. 1/86

PC Interface for the YU3UMV Weather Pix Store (Oppermann) (Adds Disk Drive Storage to YU3UMV Scan Conv Load pix in 20 sec) No. 3/87

Receiving METEORSAT with Yagis (Schaumburg) (Not a good system for GMS receivers due to reduced Thresholds) No. 1/88

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Digital Signal Processing Techniques for Radio Amateurs (Vidmar) (Theoretical Part, Insight to the next generation of Pix systems). (Construction details should be in the 89 Editions) No. 2/88

Timer/Zoom Unit for YU3UMV Image Store (Gottwaldt) (Extra features for YU3UMV Digital Scan Conv) No. 3/88

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Current References:

NOAA/NESS : TIROS-N Series Direct Readout Services Users Guide (1982).

NOAA/NESS : The GOES Users' Guide (D. Clark) 1983.

The address below provides access to two experts on US weather satellites:

The United States Department of Commerce

National Oceanic and Atmospheric Administration NOAA

Dr Thomas D Potts E/PO2

(Satellite Program Specialist)

National Environment Satellite Data and Information Service

Washington DC 20233.

The United States Department of Commerce

National Oceanic and Atmospheric Administration NOAA

1. Direct Readout Station Operators and Data Users (APT) contact DR THOMAS D POTTS E/P02 (Satellite Program Specialist).

2. WEFAX Stations and Users contact MR JAMES R GREEN. (WEFAX Coordinator, Data Collection and Direct Broadcast Branch).Mr James R. Green

(WEFAX Coordinator, Data Collection and Direct Broadcast Branch)

National Environment Satellite Data and Information Service

Washington DC 20233.

National Oceanic and Atmospheric Administration NOAA

National Environmental Satellite. Data and Information Service WASHINGTON DC 20233.

NASA Prediction Bulletin.

Sets of "orbital parameters" are available from the following address (note this is the same data you will find as "Keplerian Orbital Elements" on this bulletin board):

NASA Goddard Space Flight Centre

Code 513, Greenbelt MD 20771.

Australian Electronics Monthly

Simple Antennas for Weather Satellites (Harrison), Jul 86.

Equator Crossing Program (Commodore) (Butler), Jul 86.

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A VHF Receiver for Weather Satellites (Day), Feb 88.

continued on page 31

EARTHQUAKE SAN FRANCISCO AND AMATEUR RADIO

JIM LINTON VK3PC

When the devastating earthquake hit Northern California on October 18, 1989, news of the disaster across the Pacific coupled with the lack of communications into the area caused anguish for Australians who feared for the safety of relatives and friends.

A line of communication which can remain open during such disasters is amateur radio. Sam Voron VK2BVS, a leading exponent of third party traffic handling, and others, sprang into action. It was nothing new for Sam, who had been involved in a number of similar activities of handling health and welfare traffic to and from disaster areas. Among those involved in the Australia-wide effort were Ken VK3CKK, Karl VK2EMF, Ray VK6RQ, and Phil VK2KEV on the NSW north coast who linked up with John VK4CY, Don VK4YI and Ron VK4BG.

In Adelaide, Den VK5LS was handling Red Cross traffic, and Larry VK4ALV took some of the load off the International Amateur Radio Network (IARN) by handling traffic using AMTOR.

Sam Voron is the Australian Director of the IARN, which had organised with the US State Department in Washington for US embassies to divert health and welfare traffic through the worldwide amateur radio network. This left diplomatic and government channels free to concentrate on the handling of emergency and official communications.

The Australian Department of Foreign Affairs in Canberra set up an earthquake telephone hotline for inquiries from the public, and referred many of the callers to the amateur radio volunteers. In Australia, through the IARN, some 400 messages from the general public were handled and passed to the United States. The local news media readily publicised the availability of the amateur radio network method of getting a message through when the normal international telephone system was clogged. Sam said: "The radio broadcast stations and newspapers listed the phone numbers of radio amateurs throughout Australia and the phones virtually didn't stop ringing".

The voluntary service provided by radio amateurs was a news story in itself. Excellent coverage was achieved on television including the *Hinch at 7* program, *Good Morning Australia* channel 9, the National Nine News, and Channel Seven News. Commercial and ABC radio stations ran stories including telephone contact numbers where the public could seek further details on how to send a message to the quake area. Sydney station 2-DAY-FM actually put out a request for volunteers to operate VK2DTN (Disaster Traffic Net - the International Amateur Radio Club station) at Sam's QTH, and 17 people with no prior experience pitched in taking phone calls and filing messages.

The WIA Victorian Division put The Age newspaper in Melbourne in direct touch with Sam, resulting in a sizeable story about Sam and a picture of Ken VK3CKK. Sydney's North Shore Times had a front page story about the activity. The newspaper received such a good response from readers to the article, the editorial staff decided to do a follow up story.

During the Jamboree on The Air weekend, which immediately followed-up the mid-week earthquake, a few JOTA stations contacted VK2DTN for a quick on-air chat to give scouts and guides a first hand account of the role amateur radio played during natural disasters. "It was an example of the type of publicity amateur radio needs and perhaps it will inspire other radio amateurs to help with the public relations side of our hobby," Sam said.

The Department of Transport and Communications rang to congratulate Sam and express its approval and appreciation of what was being done by the Amateur Radio Service. Sam said: "The amateur fraternity in the United States and Australia have traditionally been responsive to the need for communication channels during emergencies." "History is just filled with examples of the radio amateurs in both countries playing their part and helping the community."

This decade has seen a further development of that activity in Australia, due to the granting of third party traffic handling privileges in 1980. It has brought Australia and the US closer together when a natural disaster occurs. It doesn't matter whether the disaster is in those two countries, or virtually anywhere in the world, the radio amateurs of these two countries harness together to do their bit.

Sam said: "No other country apart from Australia and the United States have captured so much public attention and national media exposure of this type during emergencies." There were many countries which were, unfortunately, not using the Amateur Radio Service to its full potential during disasters, he said.

"Perhaps because they have not had the history of experience and preparedness to use widescale third party traffic handling for the benefit of the general community" Sam said.

ar

Weather Satellites

from page 30

Assembling Your VHF Weather Satellite Ground Station, Apr 88.

Predicting Weather Satellite Passes from Data Transmitted by AXM (Webb, Hayden), Sep 87.

The following publications are listed as general reading. My copies all came from book shops and publishers' remainders sales.

Observing Earth Satellites (D. King-Hele) - Good source of information on the theory of orbits at a practical level.

Satellites and Scientific Research (D. King-Hele) - Older, more technical version of the above book.

Earth Watch (C. Sheffield) A Survey of the World from Space - Good selection of LANDSAT pictures.

Man on Earth (C. Sheffield) The Marks of Man on the World - LANDSAT shows the signs left by man.

The Complete Encyclopeadia of Space Satellites (Caprara translated from Italian) - Lists all satellites from Sputnik-1 to late 1986.

continued on page 37

THE GEORGE BUSH, MA MIKHAIL GORBACHE

What has made Icom's range of transceivers world leaders in their class? Could it be the uncompromising standards of a George Bush? Is it the durability of a Maggie (Iron Lady) Thatcher? Or the innovative thinking of a Mikhail Gorbachev?

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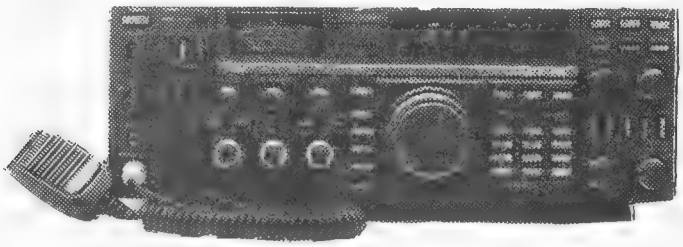
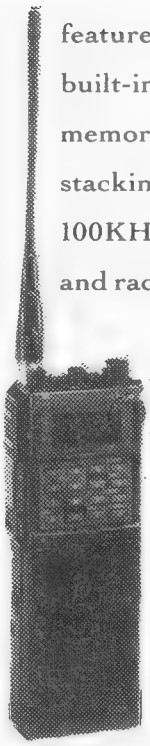
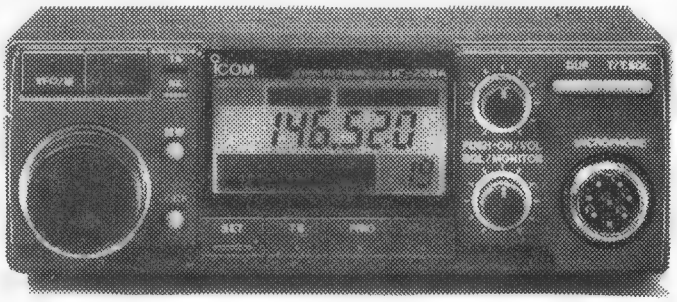


The Icom IC-765 HF transceiver features DDS synthesiser, high speed auto tuner, built-in AC power supply, 99 programmable memories, keyboard frequency entry, band stacking register, general coverage receiver 100KHz-30MHz, CI-V system for PC control and rack mounting dimensions.



The Icom IC-32AT dual band FM transceiver outputs 5.5W and has a full duplex crossband operation, on/off switchable power saver and 20 double-spaced memory channels that can store two frequencies. The programmed scan function scans all frequencies between two programmable frequencies. And Priority Watch monitors the Call Channel, a memory channel or all the memory channels in succession, every five seconds.



The Icom IC-228A (25W) and IC-228H (45W) mobile FM 144MHz transceivers are compact and easy to operate with 20 memory channels, multi-colour LCD programmed and memory scans, variable tuning steps, priority watch, main controls lit for night operation.

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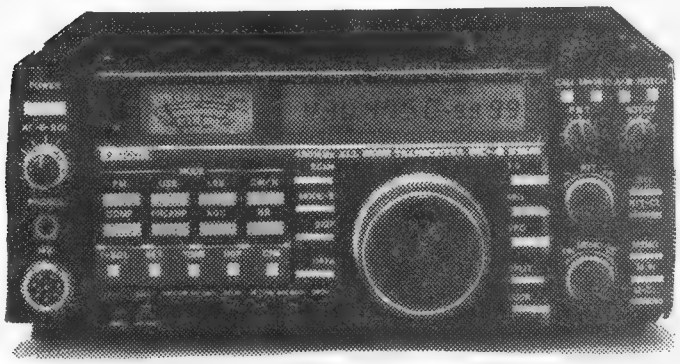
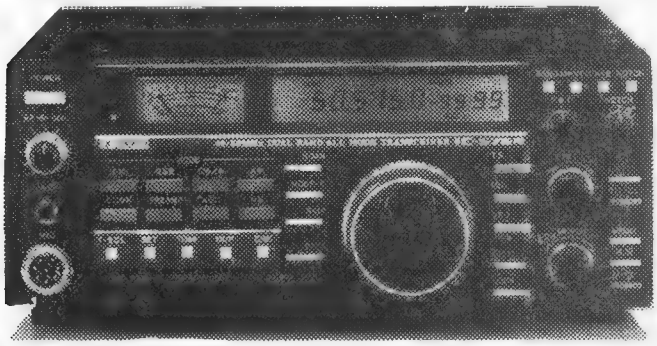


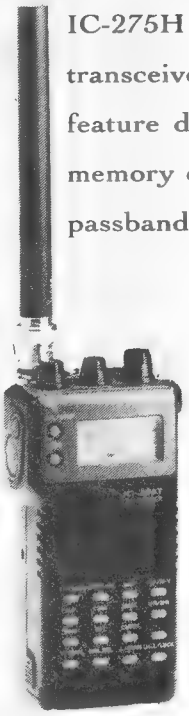
The Icom IC-475A (25W) and IC-475H (75W) 430 MHz All Mode transceivers are designed for packet mode with direct digital synthesizer (DDS), 99 memory channels, USB, LSB, CW, FM, passband tuning and adjustable IF notch filter.



The Icom IC-575A (10W) and IC-575H (100W) 28/50 MHz All Mode transceivers have a receiver coverage of 26-56 MHz and are equipped with direct digital synthesizer (DDS), 99 memory channels, and passband tuning.

The ICOM IC-4SA an amazing 70cm midget hand held. Comprising 48 memories plus 1 call channel, operating from batteries with 5 watts output at 13.8v or an external 12v DC supply. Auto power off function, scanning, scan skip, clock and time function, an optional pager and more.

The Icom IC-275A (25W) and IC-275H (100W) All Mode 144MHz transceivers are designed for packet mode and feature direct digital synthesizer (DDS), 99 memory channels, USB, LSB, CW, FM, and passband tuning.



The remarkable IC-2SAT is the ultimate in mini handheld high performance 2M FM transceivers. With convenient keyboard, re-chargeable batteries, 5W output (opt. with a 13.2v battery pack), 48 memories, a call channel and a variety of other sophisticated super multi functions. Plus 18 optional extras. Another marvellous break-through in miniaturized hand helds.

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VK3CYA - GEORGE FROM ECHUCA

DES GREENHAM VK3CO
16 CLYDESDALE COURT MOOROOPNA 3629

There are very few two metre operators in Victoria who have not heard the familiar cheery voice on one of the FM repeaters say, "This is George from Echuca". Yes, George is a very well known personality who is always friendly and co-operative and enjoys meeting new people whether they are locals or interstaters passing through this State heading north or south.

Who is George, and what is his story??

Why is he such a regular on the two metre FM band?

It has been my privilege to know this fellow for some years, and I will tell his special and unique story, not to bring him publicity or fame, but to let it be known in the hope that his story may be an inspiration to others in a similar situation . . .

George Harvey was a farmer just out of Echuca following the normal life of a "man on the land" until 1965 when an accident occurred that would change his life. Whilst felling a tree, he was struck heavily by a large branch just behind his head. The blow struck a critical spot, instantly paralysing George, making him a quadraplegic. He was transferred to the Austin Hospital for the next 14 1/2 months where he was faced with the realisation that the damage was permanent and he would never move again.

After returning to Echuca, the farm was sold and George and his wife Elma moved into a house in the town close to the hospital and medical services. At this time, there was little quality of life for George - he would sit all day in his wheel chair immobilised. He would gaze into space in total boredom with nothing to exercise his keen and active mind. In 1979, through a friend, he was introduced to CB radio. This medium enabled him to contact people "outside". He regularly spoke to truckies and CB enthusiasts until a chance meeting with two amateurs changed his life. Through their encouragement and tuition, George quickly learnt Morse code, and regulations. Because of his quadraplegic status, a special oral Morse test was arranged.

After some seven months of concentrated study under difficult conditions, George was able to pass the Novice examination, taking up the call sign VK3VYX. With an HF antenna and a FT-707, George was now active on 80 metres and 15 metres, making new friends on

George and XYL Elma pictured at the VK3CYA rig.

these bands. George was not yet satisfied - he wanted to operate on all bands without restriction. This meant more study and effort. With dedicated help from XYL Elma, George passed the full theory and then operated VK3KYA. This was in 1983. Still persistent, further efforts produced a full call in 1985. Today, George can be regularly heard as VK3CYA.

Now set up with a TH3 tri-band beam for 10, 15 and 20 metres, a trap-tuned dipole for 40 and 80 metres and a 12 element beam for two metres, George is well equipped. After working numerous bands, George has finally settled on two metres FM mode as his favourite band, where he can be regularly heard from early morning until evening on the "Wombat" 6650 repeater, often facetiously referred to as "George's Repeater!!!" Most operators have some form of record where other operator's names are recorded - some use computers or quick reference card systems to avoid the embarrassment of not remembering the name of the guy you spoke to yesterday!! George, because of his disability, cannot write down names or operate a computer, BUT he has developed something better - a phenomenal memory. He will be called by someone he hasn't spoken to for months and he will immediately answer the person by name. It is also not unusual for him to produce the name of the guy's wife or girl friend and other personal details on instant recall - better than any computer or card system!

There are many people in the amateur world suffering disabilities who use this medium to "keep in touch" and to meet and make new friends. George is very definite in his view that Amateur Radio is the best hobby that any disabled person could embrace.

Just recently, George has had an intra-ocular eye implant operation to correct a cataract condition. Simultaneously with this operation George celebrated his 71st birthday!

When next you travel to Victoria from the north on either the Newell or the Hume highways, give George a call on two metres - you will enjoy talking with him and if you are particularly fortunate, you may hear a new yarn from his inexhaustible stock of stories, ranging from pure white to VERY blue! Good luck George, you are an inspiration to all of us.

ar

Have you advised DOTC of your new address?

THE CONTEST

TONY MUSSEN VK2CAM
13 BROTHERS ST DUNDAS 2117

If you like a good yarn, and most of us do, then don't read any further. I'm not a writer and the following is based loosely (in places very loosely) on the truth.

It all started when Johno VK2JJM announced on the regular evening 80mtr "Castaways" net one night, "Why don't we have a go at the Contest?" "What Contest?" came the replies. "The John Moyle", says Johno, "what else?"

John Martin, JJM, John Moyle. Now you know how the Net got the name, the "Castaways". No self respecting Net would have such a thick bunch. But back to the Contest.

Thinking it best to try and humour him, those that could, agreed to attend a War Council at Johno's QTH. Once there, Johno was elected Chairperson and someone said they would take some minutes. Well, there was a lot of talk, not much in the minute book and the highlight of the evening was the excellent supper kindly provided by Ann, Johno's wife.

I'm not sure why, but a second War Council was called, and at the same QTH. Must have been the supper I thought! But this time it was different. They had got themselves all inspired, poor devils. Gear was being arranged and people allocated specific jobs like Ron VK2VND agreeing to be cook. This no doubt because of his many Safaris to the Cape, like in Cape York up Queensland way. "Never lost a man", said Ron, "not with my cooking", so cook he was.

It was decided that we should rough it, so Ralph VK2PEJ said he would take his Jayco campervan for use as the studio. Johno said he could supply an 8 man (person) tent for sleeping quarters. Ron said HE would take care of HIS cookhouse. Then came Air Beds and Pumps, Sleeping Bags, a Petrol Generator, (Ron again). Three fridges "3 fridges?", lighting, you name it. We are going to need a truck I though, a BIG truck. This was confirmed when our cook, now drawing deep on his Cape York trips, and no mean fool with a computer to boot, presented each of us, not only with a complete list of personal requirements, less Barra-Rods and Lures, no fishing trip this one, but a printout of each meal, just one look at the Menu confirmed my fears regarding the truck. Maybe a semi would do? But I didn't know any semi owners.

My job was to contact the relevant Council. This I did and having the interest of Amateur Radio very much in mind and anxious to make a good impression for our Hobby, including several conditions that we would undertake to comply with, should permission be granted. I'm please to report that the Council Engineer was most helpful. In view of the short time before the John Moyle Contest, he rang me giving his permission and said there was a confirming letter in the post. He also wished us good luck. I think there is a message there, like do the right thing, it often pays off.

Ron and I were to do the shopping for the food - first mistake. Never let two blokes loose in a Supermarket. People employed to stack shelves etc, found themselves running around the place, each clutching their (VK2VND) computer generated list of the items still required to fill our quickly overflowing trolleys. Talk about bedlam! And when other would-be shoppers started to leave the store in droves we were confronted by the Manager, personally escorted to the almost empty checkouts and thanked through what I thought were rather clenched teeth for our patronage. He

Going by the brook, the driving of the station earth stake. L to R Ralph VK2PEJ, Johno VK2JJM with Basil VK2EQY supervising.

Outside the cookhouse or the parade of hats.. L to R Kevin VK1KKK, now VK1KM, Basil VK2EQY The CO, Tony VK2CAM, then, John VK2JJM and John, far right, VK2DEJ.

even suggested that perhaps next time we shop some place else. I think that our mind changing at the checkout re type and quantity of various items just may have been the last straw. Oh Well!

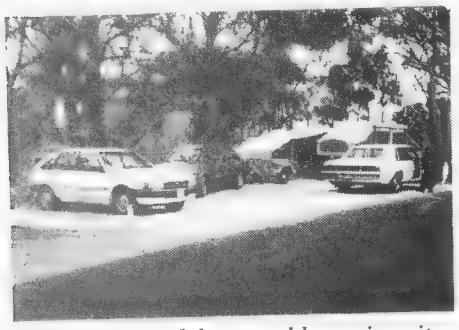
Off to the green grocer. "Plenty of greens", said Ron, "no scurvy in my camp". "Heavens", I thought - "scurvy". We were only to be away for two days, still he HAD been to Cape York and HE was the cook. Next the butcher, oh brother! Ron insisted that each steak be weighed and would only accept those of equal weight, even the snags had to be counted into eight individual lots. "No complaints in my camp," said our cook. I was starting to worry about our cook, and I was not alone. I heard some muttering from the butcher which I didn't quite catch but which must have conveyed something to his many waiting customers.

All this happened on the Friday and with good WX reports an early start had been arranged for the following day. Saturday dawned and the convoy consisting of cars, some towing trailers, station wagons all loaded to the roof, plus of course Ralph and the mobile studio formed up in the pouring rain. "It'll clear", announced Johno. Now I like a man with confidence and I like Johno, but at the moment I had little confidence and my feelings towards Johno were in some doubt. Maybe the fact that I had left a nice comfortable bed at 4.00 am had something to do with it, and for what?

Still, everything had been well arranged, even the 2 m frequencies had backups to the backups so that the convoy would always be in touch. Well we had some good QSOs, but never with each other. Somehow no two vehicles seemed to be on the same frequency at the same time and poor old Kevin then VK1KKK, now VK1KM, who was mobile up from the ACT, never did find any of us until he arrived at the camp site. Still Johno's WX prediction proved right, the rain did stop. Now all we had to contend with, because of our height some 3,500 ft, was the condensation from the low cloud constantly dripping from the trees.

The first thing we did was to elect a Commanding Officer, Basil VK2EQY got the job without dissent as he was the oldest. Basil was over Seventy when he took up Amateur Radio, and in the short space of two years went from Novice to full call, no mean achievement, and a keen Amateur to boot. Anyway, Basil was dispatched into the bush complete

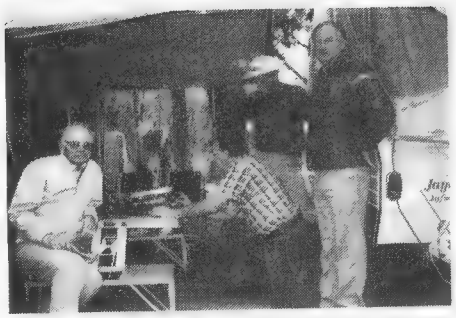
with 2 metre hand held and instructed to report in on Simplex on a regular basis. So with the CO out of the way all the preplanning at the War Council meetings came to the fore, just like a well oiled machine. With not much more than an hour to go before we were due on air, this was to be a 24 hour attempt in case I forget to tell you, it was priority first, Ron wanted his cook house up, Johno said we should all blow up our Air Beds, Kevin said no camp was a camp without a fire and proceeded to clear a safe area, Ralph said he needed level ground for the campervan, I mean studio, John VK2KAV from now on to be referred to as Kav, official Photographer to the party asked "Should he start shooting now?", and I was trying to remember just where that bottle of Port had been stored.



General view of the portable station site. Frank VK2FTD alongside his vehicle. Cookhouse - sleeping quarters - studio?

The 2 mtr crackled, it was the CO, "Could we hear him", "Yes, Basil we can hear you." "Where are you?" "I'm here," came the reply. "Good" said someone. End of QSO. Don't ask me how but in next to no time, Ron, the cook house temporarily forgotten, had the Dipole Antenna up. Next I helped Ron place the 240 volt petrol generator behind the Council Toot, a new building and still without a roof. An umbrella was permanently placed near the door later, the drips from the trees, remember? Power leads were run, power boards installed inside plastic bags, the drips again, the three portable fridges connected to the power. At least the food was going to be OK, none of the scurvy for us. A hole had been scooped out of the soft top soil and a flat rock was readied to lift the vans opposite wheel.

Now, with Ralph behind the car wheel and everyone, except Kav (he was taking pictures) giving conflicting directions, somehow or other the Jayco Studio was correctly placed to Ralph's satisfaction. I think it was about this time that someone said that he had read in a book once, that an Amateur station should have an earth stake, we all agreed that we too would



The failed no 1 rig. L to R Basil VK2EQY, the CO, John VK2JJM, the rig's owner, Tony VK2CAM, foreground is John VK2DEJ.

have an earth stake. That was, until we tried to drive it, almost solid rock under that loose dirt covering. But at last we got something down to a reasonable depth and everyone was happy that things were being done by the book. I think the 2 m spoke again at this point, it was the CO once more, "Could we hear him?", "Yes Basil we can hear you. Where are you?" "I'm here", came back the 2 m, "Good", said Johno, "now switch it off". "No way", said Kevin from his circle of stones, the chosen fire site, "He's the CO". "True" replied Johno, "leave it on".

With what seemed only minutes to go the Rig was powered up. We were about to go to air in what for most if not all was our first attempt at a 24 hour Portable Station in the John Moyle Memorial Contest. It was then that "Murphy" our constant companion since first light this morning struck once more. Steam and smoke belched briefly from the rig followed by a silence so complete that all that could be heard was the stepped up patter of drips as they hit the studio roof. Johno - it was his rig - passed out. Ron though it was a good time to put the billy on. I still couldn't find that bottle of Port and Kav took a photo of Ralph, who, being as he was a good mate of Johno's thought he may as well pass out too. Kevin lit his fire, the 2 m remained silent.

I'd better explain at this point that the party was to consist of eight operators, namely: Basil VK2EQY Commanding Officer; Johno VK2JJM Contest Manager; Ron VK2VND Cook; John VK2KAV Photographer; Kevin VK1KKK now VK1KM OC Safety also known as our Federal Member (unelected); Ralph VK2PEJ Equipment Officer; Don VK2AFT Back up rigs; and yours truly VK2CAM (not considered worthy of any title); also an uninvited bloke called Murphy.

It would seem that the latter had been in things from the very start because Don VK2AFT came down with a rotten virus and despite a vain attempt not to let us down was much too ill to attend, and much to our sorrow had to drop out. This latter point was really brought home to us with the now silent No.1 rig, no back ups. Well it just happened that when loading the car I had packed the FT7B, just in case. Do you know that little rig ran almost non stop for nearly 25 hours and never missed a beat. At last the Two Metre gave voice, "Time we were on air you blokes, What are you doing?" "Where are you Basil?", "I'm still here!", "Good" was the reply yet again and this time we did switch it off.

And so it was, at the due time and date Ron put out our first call, the Contest had begun. After lunch Frank VK2FTD along with his cousin Jane, a visitor to Oz from the UK, joined the party. This helped with the operating as we had lost the services of Don, crook with the virus. Another windfall was the arrival of John VK2DEJ. Now Don knows his way around the HF bands and was able to assist us greatly. Ron because of his cooking duties was to do less operating, but somehow managed to do both in no short measure. Quite a few were seen to ease their belts a little as meal after meal was prepared and eaten.

One bloke I have not mentioned so far is old Redeye, the phantom operator. Seems somebody came across a bottle of Port somewhere and never let on, well I'm not going to let on either.

So, there it is. Space will not permit all to be recorded but it was a fantastic weekend in very good company and we still recall highlights on air to this day. Time and memory have bent and twisted certain events something terrible.

Our thanks to Johno who did an excellent job with the log on our return, even to the extent that every member was given a copy as a keepsake. Also Kav for recording so much on film, really great. Points? Yes we go a few, not enough to win, but taking part, that's winning, isn't it? **ar**

PREVENT PIRATES !

MAKE SURE YOU SELL YOUR TRANSMITTER TO A LICENSED AMATEUR

YEOVAL TO YEOVIL

JOY COLLIS VK2EBX YEOVAL 2868

As the on Amateur Radio operator in Yeoval NSW, I was virtually "adopted" by the Yeovil (Somerset) Amateur Radio Club in December 1984, but for obvious reasons, could not participate in Club activities, other than radio communication whenever possible.

When OM Dan and I visited England in April it seemed an appropriate time to "drop in" and put some faces to the voices! Accordingly, we hired a car and gingerly headed out on to the motorways in the direction of Somerset. The English weather was "weepy" as usual, but the birds were singing, the grass was green, and who cared about a little precipitation?

We arrived in Yeovil about mid-afternoon, and after asking directions and driving twice around the same roundabout, we finally found our way to the QTH of Don G3NOF and his wife Joan, who had very kindly offered to put us up (and put up with us), and who proceeded to spoil us thoroughly for the duration of our stay.

We were certainly unprepared for the warmth of the welcome we received from the "Yeovilians", beginning with an invitation to the Mayor's Parlour to meet the Mayoress of Yeovil Mrs Bridget Dollard, followed by dinner at an old English cottage converted to a restaurant a few miles from Yeovil.

Dining with Mayoresses is not something that features very often among our normal activities in Yeoval, but Mrs Dollard's cheerful, friendly nature and a very enjoyable meal made it a most memorable occasion.

The following evening we were guests of the Yeovil Amateur Radio Club at a dinner held at the "King's Arms" Montacute, (a little village near Yeovil). Understandably, there was plenty of lively conversation to accompany the delicious food. Another evening we will not forget in a hurry, and a great opportunity to meet so many club members.

Our last evening in Yeovil was spent at a club meeting, although I don't think much business was attended to that night. Again, plenty to talk about, and definitely no QRM, QRN or any other type of interference.

Our daytime activities included a visit to the Quedam shopping area with Mrs Pat Carter of Baker Travel, whom we had previously met in Yeoval, and who has been instrumental in the twinning of the two towns.

Dan and Joy Collis VK2EBX, with members of the Yeovil amateur radio club.

Our "itinerary" included tours of the surrounding countryside with Don and Joan, among them a visit to the Fleet Air Arm Museum and Yeovilton, Sherbourn Castle, East Coker (the birthplace of William Dampier) and a trip to Cheddar.

Don proved to be a veritable mine of information, with a detailed knowledge of Somerset history, both ancient and modern, which made every excursion very interesting.

All good things come to an end, of course, and the time came to say our regretful farewells, head out to do battle with the traffic once more, and return to Cranbrook in Kent, our "home base" while in England.

We are most grateful to everyone who contributed to giving us such a wonderful time in Yeovil, especially Mrs Dollars, Mrs Carter, Don and Joan McLean and all our friends at the Yeovil Amateur Radio Club, where the true spirit of amateur radio is very much alive and well.

Thanks to one and all.

Further to the article submitted regarding visit to Yeovil, Somerset: Tim Healey G4WMV, Chairman of the Yeovil Amateur Radio Club, died suddenly during July.

He will be greatly missed by family, all club members, and children at the school where he was a teacher. We were privileged to have met him. **ar**

from page 31

The Encyclopedia of Soviet Spacecraft (D. Hart)

The Encyclopedia of US Spacecraft (B. Yenne)

(The last two can be downloaded to the kids at Xmas after you read them.)

Weather Satellite Help File

The Queensland Weasat Group hope you have found our weather satellite data files of interest. If you have any questions we have not covered, or are interested in talking to us about the subject, we invite you to contact us via the Brisbane BBS, C/- VK4ZBV, or by mail to:

Paul Hayden VK4ZBV
38 Lutzow Street
Ekibin Brisbane
QLD 4121.

continued on page 44

WIA 80 COMPETITION!

CELEBRATE THE 80TH ANNIVERSARY OF THE FIRST AND OLDEST NATIONAL RADIO SOCIETY IN THE WORLD

WIN

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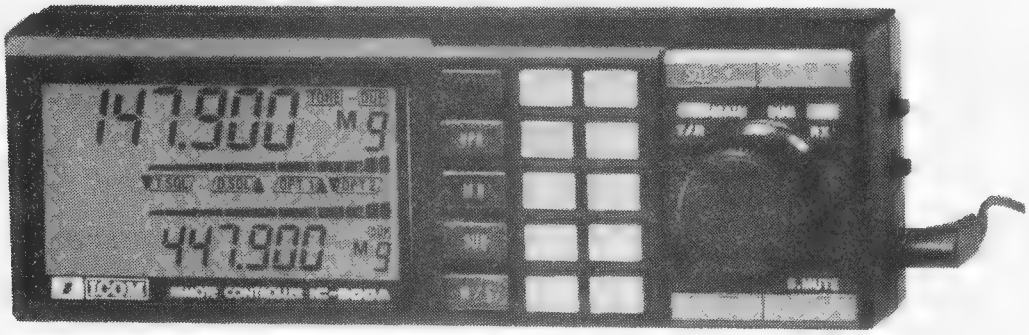

Remote Controller

How would you like to win a fantastic ICOM IC-900A series multi-band mobile control unit, complete with modules for two metres and 70 centimetres, plus your option of either six metres or 10 metres?

Thanks to ICOM Australia Pty Ltd, the winner of this competition will receive a magnificent IC-900A multi-bander system set up for 144 and 432 MHz operation, and will be able to select either the additional six-metre or 10-metre module.

However, you could still be a winner, even if you do not win this IC-900A. The three runners-up in this great competition will receive a full refund of their 1990 WIA membership fees, worth up to $65.00 each.

Who can enter?

This great contest is open to any person who is a financial member of the WIA as at 1st February 1990, except that employees or office bearers of the WIA Divisions and Executive are not eligible to win a prize.

How to enter?

Easy! Fill in this form by completing, in less than 30 words, the statement "I am a member of the WIA because . . . .", place it in an envelope together with your address label accompanying this issue of Amateur Radio magazine, and post it to "WIA 80 Competition, PO Box 300, Caulfield South, Vic, 3162", to reach us no later than 1st February 1990.

A photocopy of this form may be used if you do not want to cut up Amateur Radio magazine, but the Amateur Radio address label must be the label used to mail this issue of Amateur Radio magazine to you. This competition will be run over a period of three months, and WIA members can enter three times if they so desire.

The winning entries will be selected by a judging panel, and the winners will be announced in the March 1990 issue of Amateur Radio magazine.

.....

WIA 80 Competition PO Box 300 Caulfield South Vic 3162

Dear Sirs,
I wish to enter the WIA 80 competition, and accept the rules as published.

I am a member of the WIA because .....

.....

.....

.....

.....

(Complete this statement in 30 words or less)

Callsign or
Membership Number ..... Signed .....

HOW'S DX

STEPHEN PALL VK2PS
PO Box 93 DURAL 2158

Laos is on the air - XW

A very happy New Year to you all, full with Dx opportunities.

The past year has seen a few big "DX" stories: the 40WPA activity from Yemen, - the planned activation of 70 from the Democratic Republic of Yemen which turned out to be a non event, - then those which turned into reality: 3D2 Rotuma, T33 Banaba Island, - 3D2 Conway Reef, - ST0 Southern Sudan, - D2 Angola just to name a few. By the time you read this, 3Y Bouvet Island should have commenced activity, and now the first regular authorized activity for many years, from Laos, XW.

I was doing my regular afternoon check on the bands on the 15th of November when I heard the news: The Government of Laos has agreed to the resumption of radio amateur activities. Reports of the first QSOs came thick and fast.

After a few days, a clear picture has emerged: with the assistance of Japanese amateurs a Club station has been established with the call sign XW8KPL. It operates usually between the hours of 0130 and 1100 UTC. Quite a number of VKs and ZLs have now exchanged reports with laos with the assistance of Ben, YB3CN, net controller in the South Pacific area for the W2MIG net on 14165 kHz. Check-in time is at 0945 UTC. The operator of XW8 is: Mr Inh SIPHACHANH, Deputy General Director of KSPL which is a Laotian News Service. The address is: PO Box 310, Vientiane, Peoples Democratic Republic of Laos. Do not send "green" stamps, just 3 IRCs and a self addressed reply envelope.

On the other hand, Ben, YB3CN has agreed also to act as a "de facto" QSL manager. His address is: B Byenantea Box 545 Surabaya 6001 Indonesia.

Expect some interesting activity from Laos. The Hungarian group which operated a year ago from Vietnam, will visit Laos late November and it is planned that they will activate Spratly Islands early in December, but more of this in the next issue of "AR". A number of Japanese amateurs are likely to operate from Laos early in the new year.

What rare and "dormant" country is on the Exciting "DX" list of the future? Perhaps A51 Bhutan? Jim, VK9NS is working hard on this problem.

More news about this possible planned activity later.

Midway Islands - KH4

Gary, NY6M/KH2 and Bob KD7P/NH2 both are stationed in Guam. During the "CQ" CW DX Contest and afterwards they were active on several bands as NY6M/NH4 and KD7P/NH4 from Midway Islands. QSLs to their home call.

Macquarie Island = VKØ

By the time you read this, Grahame VKØ has left Macquarie Island for a well earned rest. he will be replaced by John, who intends to operate under the call of VKØJR. Grahame's QSLs go via VK9NS.

New DX Countries

It has been reported from several sources that the DXCC Committee of the ARRL has decided to accept Banaba Island (T33) and Conway Reef (3D2) as a new DX country. The 10 MHz. WARC Band is now accepted for the DXCC award for mixed, CW or RTTY mode. This decision will lead to more activity on this quite useable DX Band.

WARC Bands

It pays to listen, and be aware of, what goes on in the 10 MHz, 18 MHz, and 24 MHz bands. The 18 MHz band proves itself to be a good DX band. One evening (local time) within half an hour I worked UR2, LA8, JR1, KL7, W4. Most of them in the CW mode around 1100 UTC. This band is also quite useful for VK traffic around 0400 UTC.

New Prefixes

I worked Ray VY2ATP on Prince Edward Island Canadian Amateurs (VE1) who are located on that island may use the new prefix of VY. Eventually all stations will change to the new prefix which at present is optional.

There are prefix changes in other parts of the world also. Franz Josef Land in the future will use the prefix 4K2, the Soviet European islands 4K3, the Soviet Asiatic Islands 4K4. The Russian operations in Antarctica will continue to operte with the 4K1 prefix.It is reported that 4K2DX will be the new callsign of UAØIL the well known Franz Josef Land station 4K1F located in the south Shetland Islands.

VHF/UHF An Expanding World

Eric Jamieson VK5LP - "The Voice by the Lake" wishes to apologise to his readers for the absence of his column this month. Eric is confined to hospital. This is the first deadline he has missed in twenty years. We wish Eric a speedy return to good health - Ed **ar**

Murphy's Corner

Wasn't that a good photo of Federal President Peter Gamble VK3YRP on last month's cover? The highly competent photographer should have been acknowledged. He was none other than the ever willing John Friend VK3ZAB. John has just returned from hospital, following an operation, and we wish him a speedy recovery.

On P35 of the December issue, we managed to corrupt the call-signs of two individuals in the picture:

JA1AH should have read JA1AN and ZL2AHJ was really ZL2AMJ.

ar

A Call to all Holders of a Novice Licence

Now you have joined the ranks of amateur radio, why not extend your activities?

The Wireless Institute of Australia (N.S.W. Division) conducts a Bridging Correspondence Course for the AOCP and LAOCP Examinations.

Throughout the Course, your papers are checked and commented upon to lead you to a successful conclusion.

For further details write to:

The Course Supervisor
WIA
PO Box 1066
Parramatta NSW 2124
(109 Wigram Street, Parramatta)
Phone: (02) 689 2417

11am to 2pm Monday to Friday
7 to 9pm Wednesday

The Baltic States will also change their prefixes: Latvia will operate under YL, Lithuania as LY and Estonia as ES.

During October some Nigerian stations used the prefix 5N29 in celebration of the 29th anniversary of independence. Both the SSB and CW sections of the "CQ" World Wide Contest produced the usual crop of rare prefixes: the delight of prefix hunters. 4UØITU by a group of USA amateurs, J6 Santa Lucia, USA amateurs, P4OGD Aruba by John W2GD, PJ4U from Bonnaire by K3IPK, S92LB Sao Tome and Principe by Walt DJ6QT, — VP5T Caicos and Turks by NM2Y and several other rare prefixes. The special prefixes of: CT500A, CT500B, CT500C, CT500D celebrated in December the discoveries made by Portugese explorers 500 years ago.

Nauru C21 And Western Samoa 5W

Lee, VK2LEE reports that Jon C21AJ has started his two years contract on the island which has a population of 8000. QSL to Jon Leeman PO Box 29 Republic of Nauru Central pacific.

Lee also reports that Pete 5W1KT has set up shop for two years in Western Samoa. Pete intends to be active also in the CW and RTTY mode. His address is: PO Box 1672 Apia, Western Samoa, South Pacific.

Interesting QSOs And QSL Managers

BY5HZ — Han — 28499 kHz at 0405 UTC. QSL to: PO Box 804, Hangzhou, PRC.

ZF2OC — Chuck — 21205 kHz at 0508 UTC. QSL to: KC3ET.

N8BJQ/KH9 — Wake Island — 21026 kHz at 0647 UTC. QSL to: N8BJQ.

YJ8NMB — Marek in Port Vila — 21200 kHz. 1027 UTC. QSL to: Box 217 PO Port Vila, Vanuatu.

KH6JEB/KH7 Rick on Kure Island, 14222 kHz at 1055 UTC. QSL to home call.

KG4SG Sid on Guantanamo Bay, 14165 kHz at 1143 UTC. QSL to: KK8X.

VP5JM Judy (YL) on Caicos, — 14165 kHz at 1200 UTC. QSL to: W3HNK.

PJ 2 WOL Erwin in Curacao, — 14165 kHz at 1111 UTC. QSL to: PO Box 3509, CURACAO West Indies or via the Bureau.

BZ1FB Meng in Beijing, 14165 kHz at 1115 UTC. QSL to: KF7SH

CEZIG Jaime on Easter Islands, 21205 kHz at 0528 UTC. QSL to: NR8J.

5N9FEA Elie in Nigeria, 1422 kHz at 0638 UTC. QSL to: PO Box 65, Zaria, Nigeria.

N9AG/J6L Scott on S.Lucia, 21205 kHz at 0514 UTC. QSL to home call.

HP2/KC4BFK 14222 kHz at 0557 UTC. QSL to: home call.

V29OA in Antigua, 14226 kHz at 1115 UTC. QSL to: W7KNT.

VQ9PN Pat on Diego Garcia, 14226 kHz at 1202 UTC. QSL to: N4DQY.

P43HM Hum on Aruba Island, 14 MHz. QSL to: PO Box 2066 Aruba West Indies.

KG4DD Doug in Guantanamo Bay, 28 MHz at 0103 UTC. QSL to: WD8QCU.

T3ØNAD Box in West Kiribati, 28 MHz, 2200 UTC. QSL via J01CRA.

3X1SG Edmond in Republic of Guinea, 28 MHz 2319 UTC. QSL to: ON7GV.

OY6FRA Faroe Isl 28 MHz. QSL to callbook address.

AH2BE/KH9 Edward, Wake Island. QSL to: KA6V.

9M6KT QSL to: KL7GRF FK8FA Aimee (YL) PO Box 447, Mont Dore, New Caledonia.

H44GR QSL to: PO Box 127, Honiara, Solomon Islands. KA5UWN/KH2 QSL to: WD5GIV.

WB6PZF/KH6 QSL to Box 242, Captain Cook, Hawaii 96704, USA.

HKØNZI QSL to PO Box 1019 St Andres Isl Colombia.

HKØHEU QSL to: PO Box 3501 St Andres Isl Colombia.

5N9NRK QSL to: HB9WU. 9Y4RJS QSL to: PO Box 3495 La Romain, Trinidad.

NT2X/NHØ QSL to: KQ1F. HC8U QSL to: W6UE. 5W1HK QSL to: SM7PKK.

ZK2RY QSL to: OH3GZ. KH8/SM7PKK QSL to: SM7PKK. T28RW QSL to: ZL1AMO.

YJØR QSL to: OH1RY.

From Here And There and Everywhere

EL2WK Bill and his wife Doreen EL2DK are back in Liberia after a well deserved holiday back home. They are active again on 14 MHz at their usual time around 0600 UTC QSL to: G3OCA.

I was fortunate to work Iris Colvin W6QL, who was working from Niger under the Call 5U7QL. Whilst typing this report I had a bit of a listen on the band. There she was again in Burkina Faso, and I worked her with her XT2KG call. QSL for both calls to YASME PO Box 2025 Castro Valley CA 94546 USA.

Javier, XF4T from Revilla Gigedo Island can be heard with a very strong signal on 14222 or 14226 at around 1200 UTC. QSL to: XE2TCQ Jose Javier C Quinones, PO Box 66-D, Tijuana-Baja California, 22150 Mexico.

Had a pleasant QSO with Olle, SMØ0IG/P/YN in Managua, Nicaragua. Olle is a news-correspondent for "Radio Freedom",.and he hope he will be at that QTH until June 1990. ED8URL was a special commemorative station — for the Canary Islands Amateur Radio Club. QSL to: EA8ZY PO Box 221 Las Palmas 35080 Canary Islands.

LU6ELF/D2 has now a QSL Manager: Carlos, N4THW.

ZK3 Tokelau Islands. Matts SM7PKK proposed visit to these islands was abandoned because of boat transportation difficulties at this time of the year. Les VK4DA says he finally worked all the 40CQ Zones in five years with 50 Watts and a G5RV antenna. In his opinion, the 15 mtr Band is really shaping up for very good DX.

Interesting QSLs Received

9X5AA, 7P8DX, A61AC, CX2CS, TX3DA, HC5AI, 3D2VV, AH9AC, FF10SB (French DX Foundation Club Station) HK6GLR.

The Big Question!

For my own information as an "acting" editor of this DX Column, I want all the readers who actually do read this column to drop me a line and express their opinion of the usefulness of this column. No lengthy formal letters are needed. Comments on the back of your QSL card will be sufficient. I want to know: Do you read this column? Always? Or just from time to time? Are you an active DX-er? Do you find the information in this column useful, or you find it as an "old hat" repeat news? What changes should I make in the column? What do you want to hear about DX in this column? Shall I continue writing this column, or shall I give up the ghost? Your constructive ideas are wanted. Out of a readership of about 8000 or more, hopefully I expect to receive at least a dozen or so replies fom all those, whose particular interest in amateur radio is "dX"-ing. When do I want these comments? Yesterday would have been better, but today will be sufficient. Do it now. today. I will keep you posted about the result. Thank you.

Finally I want to thank all those who contributed with news, comments and info for this issue: namely Pat VK2RZ, Lee VK2LEE, Les VK4DA and the "QRZ DX" weekly news Bulletin.

Please keep up the good work, and send me the news, I cannot be continuously 24 hours on the band to see what is happening. 73 and good DX to all of you.

Late Stop Press

After considerable delay and confusing rumours, the Hungarian DXpedition to Laos commenced operations on 8/12/89. Call signs are: XW8DX (SSB) and XW8CW (CW). They were heard around 0900 UTC on 21235. They were also working on 21035, 28025 and 28495. QSL to F6HIZ. I worked them on 9/12/89. **ar**

CONTESTS

FEDERAL CONTEST MANAGER FRANK BEECH VK7BC
37 NOBELIUS DRIVE LEGANA 7277

Contest Calendar

January

1-6 Ross Hull memorial contest.
27-28 Second trial VHF/uHF National Field Day contest. (Rules November "AR).
28th REF French contest CW section. (Rules December "AR).
27-28 UBA Belgian UBA contest (Rules this issue).

February

24-25 REF French contest, Phone section (Rules December "AR).
24-25 UBA Belgian contest, Phone section. Rules this issue.

March

10-11 RSGB Commonwealth contest. Rules this issue.
17-18 NZART National Field Day contest.
17-18 WIA John Moyle Memorial Contest. (Rules next month.)

From the result of the 1989 Commonwealth contest, when conditions were "not the best" it is very pleasing to note that from the leading ten stations 3 were VKs.

From the Belgian national society, I have received a booklet containing the results of the 1989 UBA contests. This is far too lengthy to print out in full so I will list the results of the VK stations mentioned.

In the CW section, single opertor, single band. (20m) two VKs are listed, VK5AGX with a score of 2752 points, and a certificate winner.

VK4TT with a score of 282 points.

In the single operator multiband section, only two VKs appear;

VK8XX with 11310 points, and a certificate.

VK2BQQ with 1020 points.

From the SSB section of the contest the following VK station is mentioned.

Single operator, single band;

VK4KRP with a 10m score of 1859 points.

Commonwealth Contest

Rule 7: to those of us who do not bother to scrutinise the rules of this contest because they are so predictable, please read this rule 7, as it will be worth looking out for the various HQ stations mentioned, they being worth 20 points! The contest manager G3FXB has asked me to bring the matter of HQ stations being set up by the institute to promote activity in the contest. It would appear that the other societies may be using the equivalent to our official institute callsigns as bonus sources. This would have to be debated at federal level, and is something that the next contest manager will have to look into.

I hope you all enjoyed the Ross Hull memorial contest and took advantage of the alternate location section. Please send in a log. The second trial VHF/UHF contest later on this month should give you all another excuse to get the portable gear tweaked up, and try that location that you like the look of. Please have a go this year, and perhaps the idea of this contest could become a permanent feature in the WIAs contest calendar.

UBA Contest 1990

Rules The Union of Belgian Amateurs invites all amateurs worldwide to participate in this contest.

European Community The UBA has the honour to announce that this contest will be challenged under the Patronage of Mr Jean Dondelinger, Member of the Commission, responsible for Communication, information and Culture.

1 Name and Aim: To contact as many Belgian and other amateurs as possible and to provide a way to achieve the WABP and the EC Awards in the "UBA Contest".

2 Periods: Last full weekend of January and February each year from 13.00 UTC Sat to 13.00 UTC Sun CW 27-28 January — SSB 24-25 February.

3 Classes: A. Single Operator Single Band (SOSB). B. Single Operator Multi Band (SOMB). C. Multi Operator Single Transmitter (MOST). D QRP 10 Watt inputt, as class B. E. SWL as class B.

4 Bands: 10.15.20.40.80 m. Frequencies according to IARU Regio 1 Bandplan. CW: 3.500 — 3.560; 7.000 — 14.00 — 14.060. 21,000 — 21,080; 28.000 — 28.100 MHz. SSB: 3.600 — 3.650; 3.700 — 3.800; 7.040 — 7.100; 14.125 — 14.300; 21.400; 28.500 — 28.800 MHz.

5 Contest Call: CW "TEST UBA"; SSB "CQ UBA". Exchange: RS(T) + serial number starting from 001. Note that Belgian stations give their province abbreviation which is part of the exchange (e.g. 59001/AN).

6 Scoring: QSO with ON, DA1 and DA2 counts 10 points. Q S O with other European Community member stations as listed below counts 3 points. Q S O with any other station counts 1 point.

7 Multipliers: All Belgian provinces; AN, BT, HT, LB, LG, LU, NR, OV, WV Each of the prefixes; ON4, ON5, ON6, ON7, ON8, ON9, DA1, DA2 All other countries from the European Community; CT, CU, DL, EA, EA6, EI, F, G, GD, GI, GJ, GM, GU, GW, I, IS, LX, OZ, PA, SV, SV5, SV9, SY, TK, ZB2. A total of max 42 per band.

8 Final Score: Total QSO points times the total number of multiplier points.

9 Special Conditions: None

10 Logs Showing date, time (UTC,) station worked, exchange with respective serial number, multipliers and points. Only note multiplier first time. Use a separate log for each band. Each entry must have a summary sheet showing all the scoring information, class of entry, mode, name(s), call sign(s), full address and a signed declaration. The IARU R1 standard format sheets are recommended.

Remarks: Computer print-outs are accepted provided they have the same format as hand written logs. Computer logs on 5 1/4 disk can only be accepted when the format is MS-DOS/ASCii.

SWL Rules: Only stations taking part in the Contest may be logged for scoring purposes. Logs should show in columns; Time (UTC), callsign of "Station Heard", complete exchange sent by this station, callsign of station being worked, a RS(T) report on "Station Heard" at SWLs QTH new multiplier and points claimed. If both sides of a contest contact are heard

they may be claimed as separate stations and the callsigns are to appear in the "Station Heard" column as in the example given over.

A station may only appear once per band as station heard. In the column "Station Worked" the same station may not be logged more than 10 times per band.

11 Declaration:
"I declare that all contest rules and all the rules and regulations for amateur radio operations in my country have been observed and adhered to. I accept the decisions of the Contest Committee."

12 Address for logs: **UBA HF contest committee Galicia Jan ON6JG Oude Gendarmeriestraat, 62 B-3100 Heist op den berg Belgium**

13 Deadline: All entries must be postmarked not later than 30 days after the contest.

14 Awards: The new "UBA CONTEST AWARD" will be sent to the highest scoring station in each class from each country. Other participants receive a certificate provided they contact at least 40 stations. The EC TROPHIES go to the EC winners of class B from each event. A special engraved plague is donated by ON6JG to thr OVER ALL winner of class B in the SSB contest.

15 Penalties & disqualification:

Penalties for:

- Incomplete or incorrect exchange, NIL points
- Deduction of 3 times QSO value for any unmarked duplicate contact.

Disqualification applies for:

- Incomplete or late entry (the latter will be treated as checklog).
- violation of the rules.
- Unsportmanlike behaviour.
- excessive number of unmarked duplicates (>2%).

These rules conform to the IARU Regio 1 Contest Standard Format.

Remember to leave a three second break between overs when using a repeater.

Time UTC	Station Heard	Exchange Sent	Station Worked	RS(T) SWL	Bonus /Mult.	Points	Check Only
10:11	ON7AR	59121/AN	UQ2GWW	58	ON7-AN	10	
10:11	UQ2GWW	59198	ON7AR	59		1	
10:13	E17M	59212	ON7AR	57	EI	3	

Commonwealth Contest 1989

Position		Callsign	Score	80m	40m	20m	15m	10m
1	*	VE6OU/3	6847	425	1480	1955	1744	1243
2	*	6Y5HN	6754	225	1494	2035	1835	1165
3	*	ZL3GQ	5727	449	1280	1720	1548	730
4	*	VE7CC	5699	50	1055	1984	1415	1195
5	*	VK2APK	5418	395	880	2065	1170	908
6	*	VK6LW	5305	50	725	2100	1335	1095
7	*	GXFXB	5295	300	1055	1552	1423	965
8	*	VK4XA	5270	250	780	1595	1330	1315
9		G3PEK	4790	445	1035	1415	1110	785
10		G3MXJ	4765	230	910	1575	1120	930
11		G4BUO	4645	280	810	1455	1175	925
12		G4OBK	4465	310	795	1455	1115	790
13		G3LET	4419	260	959	1400	1085	715
14	*	ZL1AI2	4160	435	865	1290	1060	510
15		VK6DZF	3979	0	560	1709	1110	600
16		VE3ST	3858	130	775	1548	910	495
17	*	9J2BO	3819	99	470	870	990	1390
18		VK2AYD	3622	150	680	1402	805	585
19		VE5RA/7	3605	0	655	1305	890	755
20		G3NOM	3575	125	635	1115	945	755
21	*	VK5AGX	3534	380	645	1379	720	410
22		VE7UZ	3464	25	585	830	964	1060
23		G2QT	3419	150	565	1099	860	745
24	*	V01AW	3265	255	350	1020	785	855
25	*	VK3MR	3169	200	839	1105	650	375
26	*	VE2KN	3120	105	290	1510	805	410
27		VK5GZ	2910	350	475	1145	730	210
28		VE3JKZ	2890	75	485	1105	650	575
29		VK3ZC	2755	125	655	1210	610	155
30		G3KMQ	2740	230	440	1030	525	515
31		ZL1HV	2700	150	630	1005	665	250
32		VK5BN	2630	250	455	800	600	525
33		VK4XW	2595	280	620	825	665	205
34		G3TBK	2585	0	405	755	990	435
35		VK2AQF	2494	125	375	1090	724	180
36		G3JJG	2385	100	325	805	650	505
37	*	ZL2TX	2375	0	325	1025	1025	0
38		G3EBH	2365	0	235	775	730	625
39	*	VE4JB	2350	0	460	810	860	220
40		G5MY	2335	50	380	1055	575	275
41		GW3HGJ	2313	100	465	970	494	284
42	*	VE6BF	2277	0	225	873	644	535
43		G3OLU	2250	25	175	875	585	590
44		GM3CIX	2235	0	230	960	620	425
45		G3EFS	2190	125	415	680	645	325
46		G4WYG	2170	75	125	890	545	535
47		VK2DID	2134	280	200	804	475	375
48		VK6RU	2112	0	285	1110	542	175
49		G3SEP	2110	125	480	525	555	425
50		G3VW	1989	0	300	789	485	415
51	*M	VK6AJ	1930	-	-	1930	-	-
52		G3MPB	1920	0	355	835	480	250
53	*	VS6UO	1915	0	300	885	385	365
54	8	VE1ZZ	1879	500	690	689	0	0

55		G3SWH	1875	75	250	770	480	300
56	*	ZD8JP	1850	125	440	565	205	515
57		G2HLU	1849	50	304	760	440	295
58		G3ESF	1800	0	280	795	355	370
59		VK2EL	1785	0	275	660	595	255
60		G3GLL	1770	125	200	685	445	315
61		VK28QQ	1745	0	599	802	224	120
62		GW4XXF	1707	125	150	678	380	374
63	*	VK7RY	1699	125	460	635	430	49
64	*	5NOBRJ	1634	49	180	530	225	650
65		VK3KS	1629	0	0	895	559	175
66		VK3MJ	1613	0	0	759	654	200
67		G3NKS	1575	125	350	700	145	255
68		G3FKH	1569	0	0	844	425	300
69		G3VDL	1560	76	235	535	440	275
70	*	VU2PTT	1545	0	305	910	0	330
71		G3AWR	1440	0	125	580	435	300
72=		G3HJF	1420	0	50	430	430	510
72=		VK3DNC	1420	0	275	610	435	100
74		G3NKC	1389	50	174	640	250	275
75		G3KSH	1333	150	254	754	125	50
76	*M	G3RTE	1330	-	-	-	1330	-
77		G4LZB	1250	0	50	725	250	225
78	M	VK4TT	1240	-	-	1240	-	-
79		VK3DQ	1223	25	423	340	310	125
80		G3JKY	1160	0	25	655	330	150
81	*	VP2MT	1120	0	0	565	185	370
82		G3WRR	1115	0	75	375	440	225
83		VK400	1109	230	205	469	205	0
84		VK2AIC	1100	0	0	450	400	250
85	*M	G3PJT	1059	-	-	-	-	1059
86		G4KGK	1009	0	25	609	175	200
87		G4HZV	1000	0	0	500	300	200
88		G3CSR	980	0	0	350	380	250
89		G38PM	969	100	99	460	235	75
90	M	VK2KM	955	-	-	955	-	-
91		G3DPX	925	0	75	375	150	325
92	*M	VK7RO	910	-	910	-	-	-
93		VK38DH	902	0	0	400	302	200
94		5NOELT	895	0	130	325	250	190
95	M	G4AZN	865	-	-	-	865	-
96		VK3XF	805	200	225	380	0	0
97	M	VK3JI	794	-	-	794	-	-
98		G6NK	739	0	0	539	200	0
99		VK5HO	733	175	280	50	200	48
100		VK6RZ	730	0	365	215	50	100
101	*M	VE3HX	715	-	-	-	-	715
102		G2BLA	710	0	199	319	165	125
103	M	G4IQM	705	-	-	-	-	705
104		VE1EP	643	48	80	425	100	0
105		G4CZB	649	74	50	175	200	150
106		VE21	633	0	278	185	170	0
107		GW3SB	600	0	0	275	225	100
108=	M	VU2UR	595	-	-	-	-	595
108=	*	Z23JO	595	0	25	140	25	405
110	*M	GM3CFS	575	-	-	575	-	-
111	M	G4UZN	570	-	-	-	-	570
112		ZL38J	565	0	75	490	0	0
113	*M	G4ZOB	555	-	555	-	-	-
114		VE1GI	554	66	110	140	216	22
115		VE3OMM	545	0	180	125	240	0
116		VK3FC	534	125	409	0	0	0
117	M	VK3XB	455	-	-	-	-	455
118	M	G3VLL	450	-	-	450	-	-
119	*M	VE2ZR	425	-	-	-	425	-
120		G3HAL	250	0	0	225	0	25
121	M	VE2FFE	246	-	-	246	-	-
122		G8QZ	125	0	75	0	25	25
123		M	VE2ICU	88	-	-	-	88
124	M	VE8ID	50	-	-	50	-	-

Note: award winners marked with asterisks, monoband entries marked "M".

IAN J TRUSCOTTS

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Listener's Section

Position	Callsign	Score	80m	40m	20m	15m	10m	1
RS24775	2718	228	565	955	445	525	2	
BRS1066	2540	125	370	1080	590	375	3	
BCRS195	1397	200	280	487	225	205		

Commonwealth Contest 1990 Rules

(Participation in this contest will count towards the HF Contest Championships for UK entrants).

1. Date and time: 12:00gmt Saturday 10th March to 12:00gmt Sunday 11th March 1990.

2. Aims: The Commonwealth Contest is intended to promote contacts between stations in the British Commonwealth and Mandated Territories.

3. Sections: Single-operator entries only from RSGB members resident in the UK, and licenced radio amateurs within the British Commonwealth or British Mandated Territories. Entries may be single OR multi-band (single band entries should claim points on one band only; details of contacts made on other bands should be in the form of a checklog and will not score points or bonuses; multi-band entries will not be eligible for "single-band awards). Entries will not be accepted from GB prefixes, nor marine or aeronautical mobiles.

4. Bands and mode: A1A only in the 3.5, 7, 14, 21 and 28MHz bands. Entrants should operate in the lower 30kHz of each band, excvept when contacting novice stations that operate above 21030 and 28030 kHz. Cross-band contacts will not count for points or bonuses.

5. Operation: Entrants must operate from the same location during the contest and strictly within the terms of their amateur licence. Entrants may not receive any assistance whatsoever during the contest, including the use of spotting nets or other bonus assistance.

6. Exchange: Contacts may be made with any station using a British Commonwealth prefix, except those within the entrant's own call area. A contest exchange consists of RST and serial number (starting at 001 and increasing by one for each successive contact).

7. "Headquarters" stations: Commonwealth society HQ stations active during the contest will also send "HQ" after the serial number to identify themselves. Every HQ station and counts as a separate call area (and thus attracts the 20 point call area bonus), and entrants may contact their own HQ stations for points.

8. Scoring: Score 5 points for each completed contact, plus a bonus of 20 points for each of the first three contacts on each band with a given Commonwealth call area (as shown in the accompanying list). Note that all UK prefixes count as one call area, and UK entrants may not contact other UK entrants. Duplicate contacts must be clearly marked as such and no points or bonuses may be claimed (unmarked duplicates will be penalised at ten-times the claimed points plus the points themselves, and entries with more than five such dupes may be disqualified). Dupe sheets would be appreciated by the adjudicator.

9. Documentation: Use separate log sheets on each band, in the standard format. RSGM HVC1 contest log sheets are preferred, although overseas entrants may use similar sheets from their national societies. Computer-printed entries should follow the same format, showing callsign, RST/serial number sent, same received, bonus points and points claimed against each contact. Complete a cover sheet with details of the station and operator, total claimed scores on each band and grade total, plus your correspondence address. All entries should include signed declaration as follows: "I certify that the station was operating within the terms of my amateur licence and that I observed the rules in spirit of the contest".

10. Entries: Send your entries to the RSGB HF Contest Committee, PO Box 7 Lichfield, Staffs WS13 6UJ, ENGLAND to arrive before April 9th 1990 (overseas entrants are advised to forward their logs by airmail as late entries will be treated as checklogs). To receive a personal copy of the 1990 results and 1991 rules, overseas entrants should include a self addressed envelope and sufficient IRCs for return postage. Entries become RSGB property. In the event of any dispute, the ruling of the council the RSGB shall be final.

11. Receiving section: rules as for the transmitting section except that (a) Holders of transmitting licences for frequencies below 30MHz are not eligible. (b) to count for points, stations outside the entrant's own call area must be heard making contest contacts (CQ or test calls, non-contest contacts and station in the entrant's call area do not score points. (c) Logs should show: gmt, station heard and RST and serial number sent station worked, and points claimed. (d) Score 5 points for each static heard, plus 20 bonus points for each of the first three stations heard each Commonwealth call area on each band (all UK prefixes count as one call area). HQ stations count as separate call areas. A given "station heard may only be logged once on each band, and a given "station worked" may only appear once in every three contacts logged. If both stations in contact are heard, they may both be logged separately as "stations heard".

12. Awards: (a) Multi-band section: overall leader wins the Senior Rose Bowl; runner-up wins the Junior Rose Bowl; leading UK entrant wins the Colin Thomas Rose Bowl; leading stations in each call area receive certificates of merit. (b) Single-band section: certificates of merit to the leading overseas and UK entrants on each band. (c) Receiving section: winner receives the Receiving Rose Bowl; leading entrants in each continent win certificates of merit. **ar**

Weather Satellites

from page 37

I wish to thank those who have helped me with their encouragement, support, ideas, and learned opinions. I must give a special mention to my colleagues, Phil Webb, Allan Abbott and Jim Whittaker, for the many hours of stimulating debate on the subject. My thanks to Herb ZEV, Brian AHD, and Lee CXX, for providing the stimulus necessary to start the project in the first place. And last, but not least, my wife (and chief proof reader) Jean, and our family for their forbearance. 73, Paul.

ar

World Bank Callsign

The United Nations has issued the callsign 4U1WB to the World Bank Amateur Radio Club which is located in Washington DC. The club station is activated on the HF bands by staff of the World Bank, a body funded by governments from around the world, which lends money to developing and underdeveloped countries. Contacts with 4U1WB will count as mainland USA for the DXCC. QSL via KK4HD.

JIM LINTON VK3PC

ar

Repeaters additions, deletions, alterations.

Have you advised the WIA of changes needed to the repeater list?

AWARDS

KEN GOTT VK3AJU FEDERAL AWARDS MANAGER
38A LANSDOWNE RD ST KILDA 3183

Support the WIA in order to protect Amateur Radio frequencies at WARC 92

Overseas Demand For WIA 80 Award Running Strong

As mentioned in Bill Roper's column (see p5), North American amateurs quickly scooped the pool of low-numbered WIA 80 award certificates.

Certificates endorsed "first for Alabama, first for North Carolina" and for some other states have also been posted off, but more than three dozen US states are still open for these endorsements. You might care to spread the word if you come across US amateurs interested in the award, a reproduction of which appears on this page.

First VK Winner

Meanwhile, the first VK to win the WIA 80 award is Alick Pickford VK2EF of Tuross Head.

Alick completed his 80 QSOs within November, all on SSB, and his certificate has been endorsed accordingly — along with the fact that it is the first one awarded to a VK.

It is, of course, also the first awarded to a VK2 — meaning that as this column is being written, the field is open for claims for first certificate to be awarded to a VK3, VK4, etc.

And, in case you've forgotten, the rules for obtaining the WIA 80 award appeared on p4 of the September issue of AR.

ARRL Awards

Just in case there is any confusion: I am authorised by ARRL to certify applications for its Worked All States (WAS) award, but not its DXCC. For that, you have to send those precious cards to the USA.

I can, of course also supply application forms for the ARRL WAS. Please enclose a SASE if you need the form.

WIA And Other VK Awards

All being well, the information supplement in the next issue of AR will contain an updated reprint of the rules for all federal WIA awards, along with brief listings, addresses, etc, of all awards currently on offer from VK divisions, zones, clubs and special interest groups.

My thanks to all who responded to the questionnaires I sent out to gather the information needed to complete this survey of the VK award situation.

WIRELESS INSTITUTE OF AUSTRALIA

80th Anniversary Award 1910-1990

On March 11, 1910, wireless experimenters came together at the Hotel Australia, Sydney, in a spirit of friendship and common purpose. Their aim was to unite for the protection and advancement of their pursuit. The world's oldest radio society, the Wireless Institute of Australia, was thus founded.

This is to certify that .....
has submitted satisfactory evidence of having communicated with the required number of WIA members in its 80th year.

Dated ..... Certificate No. ..... President .....

New Awards From Belgium, Linz

The Belgium amateur radio society is offering a new award for 144 contacts with stations in the European Community.

Austrian amateurs are celebrating the 500th anniversary of the city of Linz, capital of Upper Austria, with a new award certificate.

Copies of the rules for these two new awards are available on receipt of a stamped self-addressed envelope. Please write to my address, rather than to the WIA office **ar**

RANDOM RADIATORS

RON COOK VK3AFW AND
RON FISHER VK3OM

Reasons Why

Some time back the Editor promised a new column on aerials. We had in fact agreed to compile a regular column, six times a year, about a month prior to the announcement, but it has taken us a little while to start.

The intention is to provide a forum where short notes on aerials and associated matters can be presented to you, the reader. We hope that you will have some contributions which we can use. Don't worry about providing a fully prepared article, some notes and a sketch will suffice, we will do the rest, with some help from the publications team. Of course if the drawings are of camera-ready quality, so much the better and the quicker the article will be published. We reserve the right to make comments on the article, particularly if by so doing readers with less experience may be helped.

Another source of input will be articles published in past issues of "AR" and in other journals which we think are worthy of being brought to the attention of members of the WIA. This month's column features such articles. Some original information may from time to time be presented by either or both of us, but we hope that it will not be necessary to do that very often.

Now to the technical side

In August 1987, Yardley Beers, W0JF, presented an article in "Ham Radio" titled "Designing Trap Antennas: a New Approach" in which he showed that there is another way to build trap antennas. The conventional method is to take a dipole at some frequency, fit traps (parallel LC circuits) resonant at this favoured frequency, and then add extra wire to resonate the system on a second lower frequency. This gives a dipole on the higher frequency, with the traps acting as insulators, and a loaded dipole on the lower frequency - two bands in one antenna. While this works very well there are some losses associated with the traps due to the high voltages and currents at resonance.

Yardley has a scheme where the traps are resonant at the geometric average of the two operating frequencies (the square root of the product of the two desired frequencies), thus the traps are never used on resonance and become impedance altering circuits rather than traps. A dipole for use on the 18 MHz and 25 MHz bands uses tuned circuits resonant at 21.2 MHz. See Fig. 1 for details of dimensions and the VSWR curves. The antenna is less than 21 feet long and is made of 14 swg wire. For 18 MHz operation the antenna is extended to a full electrical half-wave dipole by the inductance of the parallel tuned circuits and for 25 MHz operation the capacities of the circuit above resonance shortens the antenna electrically. On both bands there is current flowing in the whole of the wire and some gain results at the higher frequency. The traps are never used on their resonant frequency. whence it may be argued that their losses are reduced.

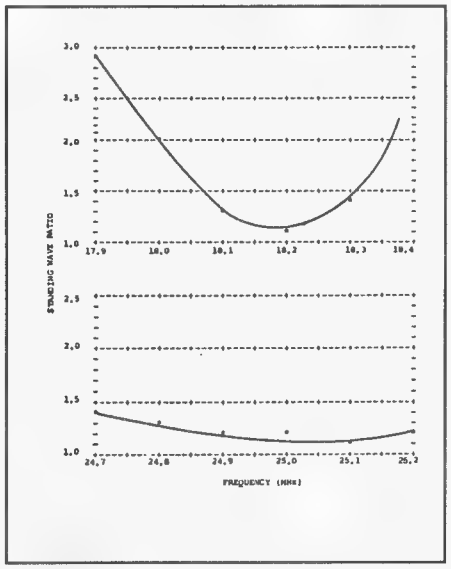


Fig 1 SWR vs. frequency for trapped dipole for use in 18.068-18.168 MHz and 24.890-24.990 MHz bands. The antenna is 20 feet, 10 inches long and has traps placed 15 feet, 2 inches apart, equidistant from the centre feedpoint. The traps use 50-pF capacitors and are self-resonant at 21.2 MHz.

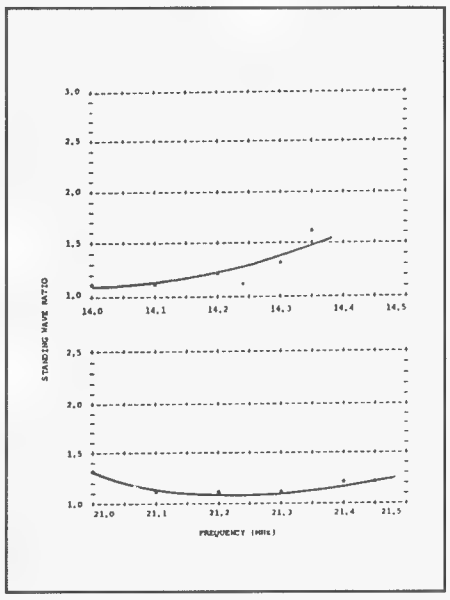


Fig 2 Standing wave ratio vs. frequency for a trapped dipole for use in the 14- and 21-MHz bands. The antenna is 24 feet, 7 inches long and has traps placed 14 feet, 5 inches apart, equidistant from the center. The traps use 50-pF capacitors and are self-resonant at 17.4MHz.

Of course they should no longer be called traps as they don't trap anything in this configuration.

Fig 2 gives details of a similar dual band dipole for 14 and 21 MHz. The design technique is reasonably complicated and requires the use of a programmable calculator or a computer and is iterative. For details the reader is referred to the original article.

Two other interesting antennas have been described in May 1988 issue of "Ham Radio". One is the "Carolina Windom".

The Windom, invented by L G Windom, W8GZ, in the 1920s, is an antenna that enjoyed popularity as a multiband antenna world wide up until the mid 1950s in VK when the introduction of TV hastened its demise. As with many multiband antennas, it radiates harmonics very well and in those days many rigs had significant harmonic output in the VHF region. The Windom is basically an 80 metre dipole fed with a single wire, the idea being that the wire has an average impedance of around 500 ohms and that a tapping point could be found on the antenna where a resistance of about this value was seen on even harmonics of 3.6 MHz. For the higher frequencies and suburban lots the triband beam soon became more popular, but recently there has been interest in a simple wire antenna that could be used on all bands, even if some compromise was involved.

This version of the Windom, shown in Fig 3, is a flat top cut for 3.550 MHz and fed off-centre with a 4:1 balum and 50 ohm coax. It reputedly works well on 20 metres and should work quite well on 80 and 40 metres. Operation on other frequencies should be "useful" if it is erected horizontally, without bends and is reasonably well elevated. It will be necessary to use an ATU to get a low VSWR.

A VSWR above 1.3:1 is likely to reduce the output of a modern transceiver due to the action of the SWR protection circuitry. So while a VSWR of 2:1 is considered low in most circles, it is desirable to reduce it further for amateur equipment.

Further the use of a balun with VSWR exceeding 3:1 may cause other problems. It is recommended that if the Carolina Windom exhibits a VSWR of about 3:1 or more on some frequencies, then operation should be avoided on these frequencies. Baluns are designed to

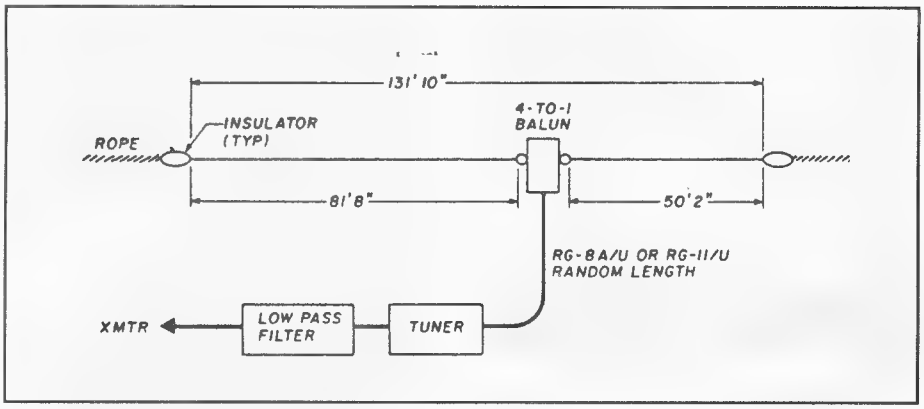


Fig 3 The "Carolina Windom" antenna works 80-10 with tuner. WA4LVB recommends that the antenna be 35 feet or higher above ground.

transform balanced loads to unbalanced loads with a defined ratio and specified loads. If the antenna impedance varies considerably from the design value, then the balun can no longer be expected to work efficiently. For example, a toroidal balun could produce harmonics of the rf signal if a high applied rf voltage causes the flux density to approach the core's saturation level. This could occur if the input power were too high or if the impedance mismatch were unfavourable. Baluns wound on rods are less likely to saturate due to the long air path and so are less prone to produce harmonics, but they too have their limits.

The main advantage of this version seems to be that coaxial feed can be used and thereby the radiation is confined to the flat-top section, hence less rf in the shack and perhaps less chance of TVI. It's certainly worth trying if you want a simple, multiband, coax-fed antenna. For those with limited space up to about 10 metres (33 feet) of the far end from the feed point could be bent down at right angles. Bending the short end is not recommended.

The last aerial for presentation this month

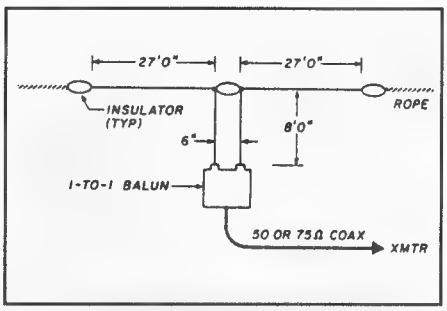


Fig 4 7- and 21- MHz colinear antenna

is a relative of the ubiquitous G5RV. Attributed to G3TKN, it is a 55 foot .long dipole with an 8 foot long matching stub to provide a shortened half wave dipole on 7 MHz and a 2 element collinear array with some 3dB gain on 21 MHz. Details are given in Fig 3.

Performance should be better than using a standard 40 metre dipole for multi-band operation because of the matching system.

Well that's it for this month. Next time we will present some aerial ideas from other journals. In the meantime if you have any suggestions or contributions to offer please send them c/o the Editor of AR. We are also prepared to try and answer any questions you have on aerial matters.

73 from me and 73 from him – the two Rons **ar**

POUNDING BRASS

Gilbert Griffith VK3CQ
7 Church St Bright 3741

An established interest in Morse Code is part of being a Morsiac (I refuse to call us Morsepersons!), and I seem to collect a lot of literature and hardware with code associations. This comes in handy if I want to introduce a newcomer to the code, as I know where to point him for books, instruction or on-air practice. In the past few months I have been sent a complete cassette based course and a couple of books, and have read about two other methods of teaching code in overseas magazines. At present my 7 year old son is trying to learn his letters but his attention span is only about 10 minutes a day! My daughter who is 11, still remembers the first couple of groups she learned 2 years ago, so I hope to interest her in the complete WIA course in the near future, maybe over the winter. I will report on any findings asap.

Did anyone get hold of the paperback "The Longest Wire" by Hugh Atkinson which I mentioned in March 1989? I have since lent the book to two people interested in the code and they are showing increased interest after reading it. Anything that stimulates an interest in Morse code can be helpful in furthering its cause, and a small library related to the subject may even stimulate your own interest as well as your friends.

When I visited the Wagga convention in November 89 I met Stewart Day VK3ZDG, of Stewart Electronic Components in Melbourne. Not only did he have a couple of Bencher paddles on display, together with dozens of books and magazines, but he sold me one. Just what I've always wanted! You can now have a real Bencher paddle for $132 (black) or $162 (chrome) which I reckon is an excellent price for a top piece of equipment.

Stewart also gave me a book entitled "Morse Code-The Essential Language" by L Peter Carron Jr, W3DKV, and after reading it I have to say that this book is essential for Morsiacs. The first chapter, "Why The Code" gives all the reasons, and then some, that we use to encourage its use, as well as some examples such as recent rescues. Chapter 2 gives 22 pages of its history, and chapter 3 onwards give details of the code, how to learn, how to increase speed, hardware etc. Of interest to me, as I have seen so many, are the groups used in first learning the code. They are: E T A R, N D K C X Y, I S H V J B, W L P U F?, M O G Z Q, 1 2 3 4 5, 6 7 8 9 0 ERROR, and two more groups of punctuation and abbreviations. This seems a long way from EISH5 etc which was the one I used first.

If you are looking for a gift idea, or just something for yourself, at $9.00 this book is a mini-bible for Morsiacs. And get this, there is a tear-out page in the back that asks for your comments and improvement ideas for future editions that you can send to the publishers (ARRL), what a good idea!

Gary Bold's (ZL1AN) column "The Morseman" in November's "Break In" had some interesting reading and featured some comments from Mel ZL2TFQ, which included the following two paragraphs.

"Without the benefit of recorded information, it would appear that I have been "stuck" at 10 to 12 wpm for two to three months, but a glance at the chart (Mel, an engineer, logged all his practice sessions) shows that though only slight, there has been an improvement.

If one makes an arbitrary threshold of, say, five percent error, that threshold has shifted from 12wpm to 18wpm, an improvement of no less than 50 percent! Perhaps if others were to note their efforts they would also show similar rates of improvement, which may help some of the depression that sets in on occasion."

Briefly, Mel's method is to copy up to "brain overload" speed and log the error rates per 100 words on a graph. The results show the

improvement, which probably comes about by **trying** to copy the higher speeds in the first place, rather than telling oneself constantly that one is "stuck".

Gary also mentioned the Samson electronic keyers which come from Frank G5BM (QTHR). Top of the range is the ETM-8C which I reviewed in AR in July 1986. If they are still available in Australia I will let you know (or the importers might let me know). Mine is still going well, and on the original set of batteries too! Despite the modifications I have made which include a jack socket for an external paddle, and a switch to change the "sense" of the paddles, ie the dots on the right paddle and dashes on the left for left-handed operation from the inbuilt paddles, while normal sense is used for the external paddles for the right hand.

John Day of Stewart Electronic Components assures me that they have Benchers and books in stock, so check out their advert elsewhere in the magazine for the address.

ar

AMSAT

MAURIE HOOPER VK5EA
11 RICHLAND ROAD NEWTON 5074

National Coordinator
Graham Ratcliff VK5AGR

Information Nets
AMSAT Australia
Control: VK5AGR
Amateur Check In: 0945 UTC Sunday
Bulletin Commeces: 1000 UTC
Primary Frequency: 3.685 MHz
Secondary Frequency: 7.064 MHz

AMSAT SW Pacific
2200 UTC Saturday, 14.282 MHz
Participating stations and listeners are able to obtain basic orbital data including Keplerian elements from the AMSAT Australia net. This information is also included on some WIA Divisional Broadcasts.

AMSAT Australia Newsletter And Computer Software

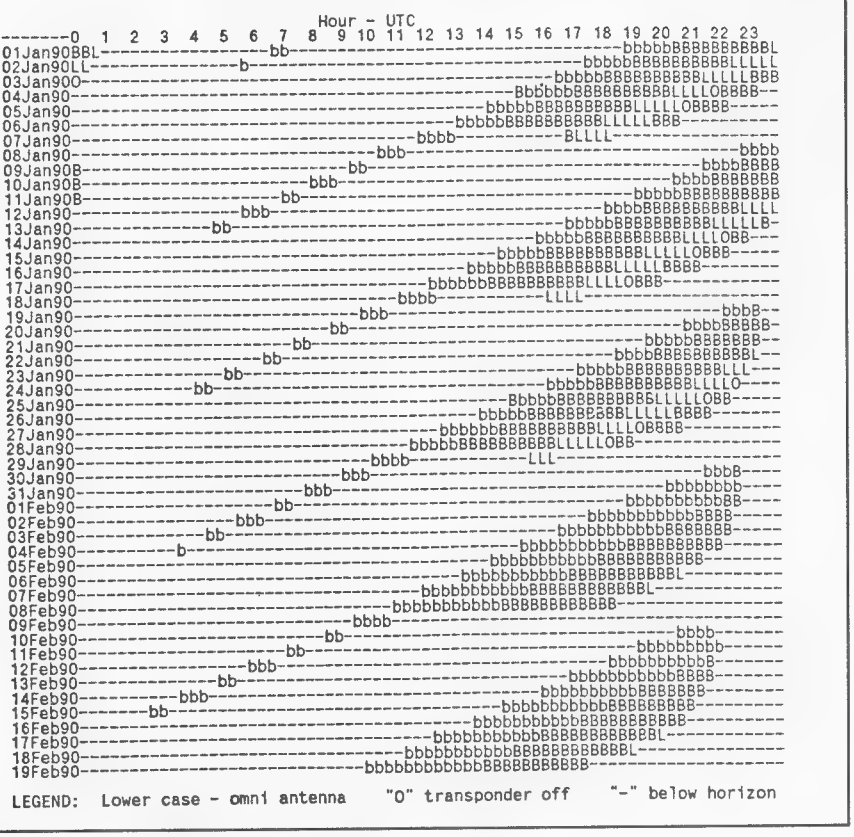
The excellent AMSAT Australia Newsletter is published monthly by Graham VK5AGR on behalf of AMSAT Australia and now has about 270 subscribers. Should you also wish to subscribe, send a cheque for $20 payable to AMSAT Australia addressed as follows:

AMSAT Australia, GPO Box 2141, Adelaide 5001.

The Newsletter provides the latest news items on all satellite activities and is a "must" for all those seriously interested in amateur satellites. Graham also provides a Software Service in respect to general satellite programs made available to him from various sources. To make use of this service, send Graham a blank formatted disk and a nominal donation of $10 per item to AMSAT Australia together with sufficient funds to cover return postage. To obtain details of the programs available and other AMSAT Australia services send a SASE to Graham.

AMSAT-OSCAR-13 Satellite Schedule
Station: Adelaide

Hour - UTC



LEGEND: Lower case - omni antenna "O" transponder off "-" below horizon

Stop Press — New Satellite Software Release For IBM & Compatibles

Graham has advised of the release of InstantTrack V1.00 by AMSAT-Australia for a $30 donation plus disks and return postage. The program requires two 360K disks or one 720K 3 1/2" disk or one 1.2M 5 1/4" disk. (It is being distributed in the US for US$50 which includes the disk and postage within the US!) The following summarizes some of the excellent features offered by this program.

InstantTrack V1.00
Copyright (c) Franklin Antonio, 1989

Introduction...

(from the software document)

InstantTrack was designed to assist amateur radio operators who need to track a large number of earth-orbiting satellites, point antennas at them in real time, estimate when communications links will be possible with operators in other parts of the world, etc. InstantTrack has several features that make it unique among satellite tracking programs, and a few features which, while not unique, are relatively uncommon among low cost satellite tracking programs. Some of these are:

Speed — InstantTrack is faster than any other tracking program. Humans should never wait for computers.

Ease of use — Most commands are a single keystroke. Usually tedious functions are fully automated.

Automated orbital element entry — In-

stantTrack reads the popular NASA and AMSAT format satellite element files and updates its database automatically. You need never again manually enter dozens of 10 digit numbers.

Automated time setting — InstantTrack automatically sets time on your computer by accessing the NBS time service via your modem.

Instant Visibility — InstantTrack shows you the positions of your "favourite" satellites, even before you issue the first keystroke. The menu of 200 satellites shows you which are visible from your location even before you select a satellite. The menu of 1754 cities shows you which cities are visible from the selected sat.

Graphics — InstantTrack displays full color high resolution (EGA/VGA) maps of the Earth, showing satellite and observers position, two kinds of satellite footprint, grayline, etc (Map projection is selectable.) Users can also select either a diagram of the satellite's orbit showing orientation of the satellite, or a map of the sky, showing the satellite's position against the stars. You can move from map to map or satellite to satellite with a single keystroke, instantly.

Large No of Sats & Stations — Instant Track supports a database of 200 satellites and 50 observer locations. A unique grouping feature allows you to categorize satellites, and perform most operations on either a selected group, or the entire database.

City Database — InstantTrack includes a database of 1754 cities worldwide. Locations of the satellite (sub-satellite points) and observers are displayed relative to the nearest city! Observing stations can be specified by entering as little as their city name!

Satellite Covisibility — InstantTrack shows you when satellites can see other satellites (ie when crosslinks are possible), when satellites are in eclipse (in the shadow of the earth), etc. This display, of course, updates in real-time, so you can see crosslinks appear and disappear.

Satellite Offpointing — (sometimes called Squint Angle) InstantTrack computes the angle by which the satellite's antennas are pointed away from you. Helps you understand why quality of communications via satellites such as Oscar-10 and Oscar-13 (spin-stabilized satellites with directional antennas) varies.

InstantTrack's graphics show you where a satellite's antennas are pointing. Maps display a contour line of squint angle. Stations within this line have low squint, and can establish the best links via such satellites.

Path Loss — InstantTrack shows the path loss between your station and the satellite in realtime.

Schedules — InstantTrack can show you the next three weeks schedule for a satellite, or one day's schedule for 20 satellites on one screen.

Realtime Rotor Control — InstantTrack supports realtime antenna rotor control via the Kansas-City-Tracker interface.

Background Mode — A unique background mode allows you to track satellites & point antennas in real-time while you run other programs.

Sun & Moon — InstantTrack tracks the Sun & Moon as well.

Tracking Multiple Stations — You can see the computed parameters (azimuth, elevation, squint, etc) both from your perspective and from the perspective of the station at the other end of the satellite link.

Documentation — Extensive and Tutorial.

Online Help — InstantTrack contains an online help facility.

Required Hardware

Any IBMPC, or AT, PS2, clone, etc with at least 512k memory. Any display type is ok for the text mode screens. Maps presently require EGA or VGA display. I'm not particularly fond of the ancient CGA boards; If you have one of those, beware that I have taken no steps to avoid "CGA snow". A numeric coprocessor (8087 or 80287) is NOT required, but it is recommended. InstantTrack isn't really Instant without a coprocessor, but it will still probably be faster at most things than any other tracking program. A mouse is NOT required, but can be used on the map screens. Due to the large file sizes involved, a hard disk is strongly advised.

OSCAR 13 News

The satellite has undergone an attitude change, and the following schedule and magnetorquing information have been supplied by Graham VK5AGR.

M de VK5AGR 20 Nov 89 **

New AO-13 Transponder Schedule**

Mode-B:	MA 000 to MA 110
Mode-JL:	MA 110 to MA 145
OFF:	MA 145 to MA 146 (with only General Beacon ON)
S-Beacon:	MA 146 to MA 147
Mode-S:	MA 147 to MA 150
	NB 2m and 70cm omni antennas will be in operation from MA 225 to MA 35.
Mode-SB:	MA 150 to MA 160
Mode-B:	MA 160 to MA 255

N QST de G3RUH 1989 Nov 21 @ 1745 utc
Magnetorque Finished

#	Peri	Sun	Earth	Sens	Alon	Alat	Spin
1	1090/1	30	1091/34/28	200	-6	—	
2	1091/2	32	1092/30/25	194	-5	—	
3	1092/3	32	1093/28/23	189.0	-2.7	—	
4	1094/5	32	1095/25/21	183.5	-1.1	28.34	
5	1096/7	29	1096/23/20	179.3	+1.6	28.63	
6	1098/9	26	1099/23/19	178.8	+3.8	29.39	

Final attitude estimated as below. Rates of change Alon +0.016 deg/day. Alat -0.094 deg/day.

Good DX! 73 GRR/JRM

Solar Eclipses

From James Miller G3RUH

L de G3RUH Nov 16 102utc—* Solar eclipses over *—

The next series of eclipses of the Sun by Earth lasts 3 weeks, from 1990 Feb 27 [Tue] — 1990 Mar 21 [Wed]. Longest 90 minutes on Mar 10, orbit 1329, MA 34-67. There is an annular eclipse of the sun by the Moon on 1990 Jan 26 [Fri] orbit 1240, MA 25-34 lasting 26 minutes reaching a maximum obscuration of 85%. Satellite visible from Australia and the Pacific.

Fuji OSCAR-12

(JAS-1) Has Been Shut Down

The Japanese Amateur Radio League announced on November 1st, 1989 that FO-12 would be shut down, and that its "brother" JAS-1b would be launched in February 1990. JAS-1/Fuji-OSCAR 12 has operated for 3 years. Power generation had decreased with time to an average value of less than 3 watts, which was not enough to meet even the minimum power requirement. Therefore, after deliberation, JARL decided that the operation of FO-12 should be terminated on 5 Nov 1989. FO-12 will be succeeded by JAS-1b in February 1990. JAS-1b will be equipped with Gallium Arsenide solar cells to boost the power budget.

From HR AMSAT New Service Bulletin 322.01 from AMSAT HQ

Microsat/Uosat Launch Date Is Advanced!

Now Set For January 9, 1990

In what is considered a surprise announcement, Arianspace officials have informed AMSAT-NA and University of Surrey this week that the launch date of the MICROSATs and the UOSAT D/E satellites has been ADVANCED 10 DAYS! The launch date is now planned for January 9, 1990. This change in the launch date is the direct result of the postponement of the previous mission, designated by Arianespace as V35A, and was planned to lift-off on Dec 13th. It appears that the problem with the V35A mission is caused by one of the primary payloads, known as "SUPERBIRD B," which is having technical problems and will not be ready for launch on Dec 13th. So Arianespace officials have decided to use this extra time to prepare for the

next ARIANE flight, known as the V36A mission; they feel that moving the MICROSAT/UOSAT launch date ahead ten days is feasible. Since the MICROSATs and UOSAT D & E, along with the primary payload SPOT-2, are ready to fly, the launch campaign will now begin on November 27th. That is the day in which the payload integration teams from AMSAT and the University of Surrey, along with their satellites, will arrive in Kourou, French Guyana. By Dec 20th all of the payloads will be fully integrated aboard the ARIANE IV rocket and the teams will then return home on December 23rd. After a short Christmas break, the final AMSAT/UOSAT teams will then travel back to Kourou and will stay there and monitor their respective satellites until the launch on January 9th.

DXpeditions Using OSCAR 10 And 13

The Legion of Indianopolis DXers of Indianapolis, Indiana will conduct a DXpedition to Bouvet Island (the second rarest radio country on the amateur bands and has not been activated for at least 10 years) in the first two weeks of February 1990 using the callsign 3Y0B. They will operate on all bands including OSCAR-10 and OSCAR-13. The operator at Bouvet Island will be Chip Margelli K7JA who was the operator during the 4J1FS operation. Operation is planned from Bouvet Island from February 1st to February 14th 1990. On OSCAR-10 & OSCAR-13 Chip as 3Y0B will downlink on 145.900 and listen on the same frequency. QSL information via WA9VGY.

Also a DXpedition is planned by CE3BFZ and KL7GRF to Juan Fernandez Island which is 600 miles northwest of Santiago, Chile callsign CE0Z suffix unknown until callsigns are assigned in about one week. Operation will be on HF, 6m, OSCAR-10 and OSCAR-13 during period April 4th to April 11th 1990. On OSCAR-10 and OSCAR-13 John KL7GRF will downlink on 145.890 and will listen on 145.895 to 145.905 QSL OSCAR and 6m contacts to VE6LQ. The QSL manager for HF contacts will be announced later.

73s from Maurie VK5EA **ar**

When you buy something from one of our advertisers, tell them you read about it in the WIA Amateur Radio magazine.

Satellite Activity For August/September 1989

1 Launches

The following launching announcements have been received:-

Int'l Number	Satellite	Date	Nation	Period min	Apg km	Prg km	Inc deg
1989 -							
067A	BSB-R1	Aug 27	UK	1435.8	35787	35777	0.15
068A	COSMOS 2037	Aug 28	USSR	116.1	1537	1503	73.6
069A	USA 43	Sep 04	USA				
069B	USA 44	Sep 04	USA				
070A	GMS 41	Sep 05	Japan	663.0	37397	197	28.7
071A	SOYUZ TM-8	Sep 05	USSR				
072A	USA 45	Sep 06	USA				
073A	RESURS-F5	Sep 06	USSR	88.7	261	189	82.3
074A	COSMOS 2038						
	through	Sep 14	USSR	114.0	1435	1394	82.6
074F	COSMOS 2043						
075A	COSMOS 2044	Sep 15	USSR	89.3	294	216	82.3
076A	COSMOS 2045	Sep 22	USSR	89.6	322	216	70.1

2 Returns

During the period seventy one objects decayed including the following satellites:-

1989-024A	COSMOS 2007	Sep 22
1989-056A	COSMOS 2031	Sep 15
1989-063A	RESURS-F 4	Sep 14
1989-065A	COSMOS 2036	Sep 05
1989-073A	RESURS-F 5	Sep 22

3 Notes

1989-067A	BSB-R1 is a UK direct broadcasting satellite known as "MARCOPOLO 1".
1989-070A	GMS 4 is a Japanese geostationary Meteorological satellite. It has transmitters on the following frequencies:- (MHz) 468.875 468.883 468.924 1681.6 1684.0 1687.1 1688.2 1690.2 1691.0 1694.0 1694.3 1694.7 2280.72
1989-071A	SOYUZ TM-8 docked with orbiting space complex MIR on September 7, 1989.
1989-073A	RESURS-F 5 was launched using the SOYUZ launch vehicle. It carried multispectral photographic equipment and West German biotechnological low gravity experiments.
1989-075A	COSMOS 2044 carried two monkeys and other biological subjects for gravity and radiation studies.

Bob Arnold VK3ZBB

Amateur Radio In Thailand

There should be plenty of activity from Thailand on the HF bands soon with lots of stations using the HS prefix. As previously reported in AR magazine, Thai authorities in 1989 gave the go ahead for amateur radio in that country. The Post and Telegraph Department of Thailand has given thousands of prospective radio amateurs application forms for a soon-to-be-held novice licence exam.

A number had already taken the exam for an intermediate licence, and after they pass an 8 wpm morse test in English will be allowed on the HF bands. This will make the first time that Thai nationals have been legally permitted to use HF. The WIA is approaching DOTC to seek a reciprocal licensing agreement between Australia and Thailand.

Jim Linton VK3PC

ar

SPOTLIGHT ON SWLING

ROBIN L HARWOOD VK7RH
52 CONNAUGHT CRESCENT WEST LAUNCESTON 7250

Welcome to 1990 and I do hope that you have good propagation throughout the year. By now, we should have come to the peak of current Solar Cycle and the daily flux should slowly decline. The geomagnetic disturbances should also decline, as it has been my experience that these are more noticeable on the upswing of the cycle.

There have been some alterations to DX programmes for enthusiasts. As I did mention in last month's column, Radio Australia made alterations to their English language output, concentrating on their Asian and Pacific audiences. This means that there has been a re-arrangement of programme releases. "Communicator" will now be heard on Sundays at 1400 to Asia, 0730 on Mondays to the Pacific and at 1030 on Fridays to Asia. The daily propagation reports have also been deleted, since Mike Bird's resignation from RA, although I have heard him continue giving the weekly summary on propagation conditions on Radio Netherland's "Media Network".

HCJB's popular "DX Partyline" is now heard on Mondays at 0800 repeated at 1030. Because of Brend Aldred's other programming committments, it was decided that the Saturday release should be dropped. On Wednesdays at the same times, "Ham Radio Horizons" hosted by John Beck is heard. The best frequencies for HCJB are still reliable 6130 and 9745 yet 11925 can be patchy.

The World Service of the "Christian Science Monitor" has re-opened their Saipan relay with a new callsign KHBI. The station has changed their format to be identical with the rest of the CSM output, instead of the pop music base that was on KYOI. KHBI is heard here excellently on 17855 kHz from 0800 till 1000 in English.

Yet another American religous broadcaster has come on the air. WWCR — World Wide Christian Revival, based in Nashville, Tennessee has been logged here on the non-allocated frequency of 15690 kHz between 2000 and 0200 with religous programming at good levels. This station reinforces the trend for religous broadcasters to obtain HF broadcasting licenses. KUSW in Salt Lake, Utah on 15585 started out as a commercial operation, but was taken over or leased by an American religous organization who also lease facilities in Equatorial Guinea (Africa). Commercial radio on shortwave has been a failure, the only one left is WRNO in New Orleans and that is also heavily dependent on religous sponsorship on Sundays to stay afloat financially.

In mid-November, I was somewhat surprised to receive a copy of the International Listening Guide, as were many other SWLs and DXers. The ILG had not been seen for 12 months prior to this, and the publisher claims that he has now ironed out the bugs, yet most of us who have been subscribing to it, will be reserving their judgement by the performance of the publisher to get the ILG out on time. This year I may subscribe to the WRTH "Downlink" which is to be a supplement to the 1990 World Radio Handbook.

The Red Cross Broadcasting Service in Geneva advises me that the next broadcast to Australasia will be on Monday January 1st from 0740 till 0757 on 13685 kHz, repeated on Thursday January 4th at the same time and frequency. Also on Monday January 29th and Thursday February 1st, there will be another programme in English. These will be at the same time and frequency. Back-up frequencies for the 0740 releases are 17670 and 21695 kHz, which are the normal Swiss Radio International Frequencies.

Well, that is all for the first column in 1990, so don't forget if you do have any news or comments, please feel free to drop me a line to the QTHR at the head of this column. Until next time, the very best of listening and 73.

RR

ALARA

JOY COLLIS VK2EBX
PO BOX 22 YEOVAL 2868

The Year That Was!

Before settling into the routine of writing 1990 instead of 1989 on everything, perhaps we will have a brief resume of last years activities:

It was an important year for at least two DX YL organizations:

YLRL held their 50th Anniversary, celebrated with a Convention in Hawaii in June, and the issue of a special Award to mark the occasion.

BYLARA celebrated their 10th Anniversary, the main function being a Rally at Drayton Manor.

New YL awards included the launching of the WARO Mountain Buttercup Award.

There was YL activity from many rare and unexpected locations, notably Kirsti VK9NL and Laila WA4ZEL from Svalbard (JW) in June; Alice N4DDK, Audrey N7HAT, Mary KA0OMX and Mary Lou NM7N from Wallis Island (FW) in July, and Doreen EL2DK, Liberia. Iris Colvin operated from many USSR localities, and later from a number of rare African countries. Florence F6FYP operated CN2YL in October, and there was also YL activity from Turkey (TA2YA) Iraq (YI1BGD) and the Virgin Islands (KP2). It all makes YL-DXCC a lot easier to attain.

ALARA made contributions to amateur radio in 1989 through involvement with JOTA, WICEN, clubs, schools, etc. Cathy VK3XBA became Federal Treasurer of the WIA; Meg VK5AOV Secretary of the Adelaide Hills Amateur Radio Society and Coral VK8NCH President of the Darwin Amateur Radio Club.

ALARA members participated in many other activities during the year, including running the refreshment stall at the Adelaide Hills Amateur Radio Club annual "Buy and Sell" (VK5 members), being represented at the Sydney Games and Hobbies Expo, assisting with the organisation of Amateur Radio Club activities and welcoming travelling DX YLs (and accompanying OMs) into their homes. My "extra-ordinary" activity was a talk to Year Nine students at the local school about "Radio Waves and Amateur Radio".

Several members celebrated long periods as amateur radio operators, notably Mavis VK3KS who notched up 50 years, and Clarrie VK3UE and Joyce VK2MI, 40 years of amateur radio.

1989 was the year we lost our oldest member, Liz W3CDQ, 90 years of age. We were also saddened by the loss of Joan VK3NLO. On a brighter note, it was also the year we "enrolled" our youngest member — Kathy, (daughter of Chris ZL2BQW), seven years old.

The highlight of the year for me was a trip to Canada and England in April, and meeting Canadian ALARA members, and members of the Yeovil (Somerset) ARC.

Well — 1989 is behind us. Now to see what we can do with the infant 1990!

ALARA Contest

The eighth ALARA Contest once again had to compete with other contests on 11th November, 1989. However some very good scores were achieved, and it proved to be a very enjoyable event for all who participated.

Unfortunately the gremlins again played havoc with my INTENDED "contesting," as this area experienced stormy conditions for most of the day, necessitating closing down of operations at frequent intervals. This was

VK8NCH Coral

VK5NEI Janet Bulling

disappointing, but on the credit side it was good to catch up with many members I do not often hear on air, and especially some of the DX members.

We would like to thank the OMs who joined us. Your participation was very much appreciated.

We hope to have the results in time for next months Amateur Radio.

Bits And Pieces

Poppy VK6YF had a busy time in October assisting with the organisation of several amateur radio displays, and doing some useful public relations work.

DL2HBM Marga Bergman

With improving propagation on 10 metres there is renewed interest once again in the International Ten-Ten Club, which issues some very beautiful awards. Many ALARA members are also members of this organisation.

Congratulations to Sue VK5AYL on becoming a very youthful grandmother. At the time of writing she only has 2 metre gear, but hopes to be able to get on the HF bands at a later date.

During the ALARA Contest Bev VK6DE worked 40 ALARA members in eight different countries, which must be something of a record! As Bev remarked, "I didn't get much sleep."

Another sleepless member was Aimee FK8FA, who kept going for much of the allotted 24 hours.

Please note: During daylight saving time the official ALARA Net on Monday evenings is held at 1000 UTC.

Errata from December column:

Mary Ketzler's callsign is KA0OMX — not KA0OMH.

Alarameet

In september this year the third ALARA get-together will be held in Dubbo, NSW. Plans for this event are well in hand, and we hope to make it the best ever.

Bookings and enquiries to Maria VK5BMT.

New Members

Only one new member this time around. Welcome to Daphne VK4IA.

May 1990 be a very happy and prosperous year for all.

CLUB CORNER

Coffs Harbour and District ARC

JOHN WILLIAMS VK2BUI

Amateur Radio Goes to the People

It was Arnold VK2ADA's idea - he felt that Amateur Radio needed publicity, and the Club of which he was President agreed. It was to be a public relations exercise a little different from most, in that Club members would man a working display of various Amateur Activities, in a public shopping centre; no preaching to the converted for these fellows!.

The Coffs Harbour and District Amateur Radio Club is a small group of around twenty-five. It was formed ten years ago, and some of the original members are still actively involved. You've probably met some of them at one of the famour Urunga Field days - Urunga is only a short distance south of Coffs.

The display was to be open Saturday, so on the Friday afternoon, four members spent some time setting up antennas on the nine acre roof of the Park Beach Plaza Shopping Centre, about five kilometres north of Coffs, and one of the biggest Regional Shopping Centres in Australia. It was a great ground plane for the 18AVT Trap Vertical - no radials needed, and the antenna mounted easily on a huge metal department store sign, along with a Slim Jim for 2M Packet Radio via the Club's repeater VK2RCH. Cables were snaked through a ventilator and left ready for connection to the gear next day.

Saturday, 7am, saw the really keen ones roll up with various bits of gear in tow - a complete VHF Packet set-up, two HF Transceivers, some equipment for showing videotapes of ATV programmes, and just so that the public wouldn't think it was all black boxes, some examples of home brew. Of course, 2M gear was available to demonstrate communication both on simplex and through the Club's voice repeater VK2RCH.

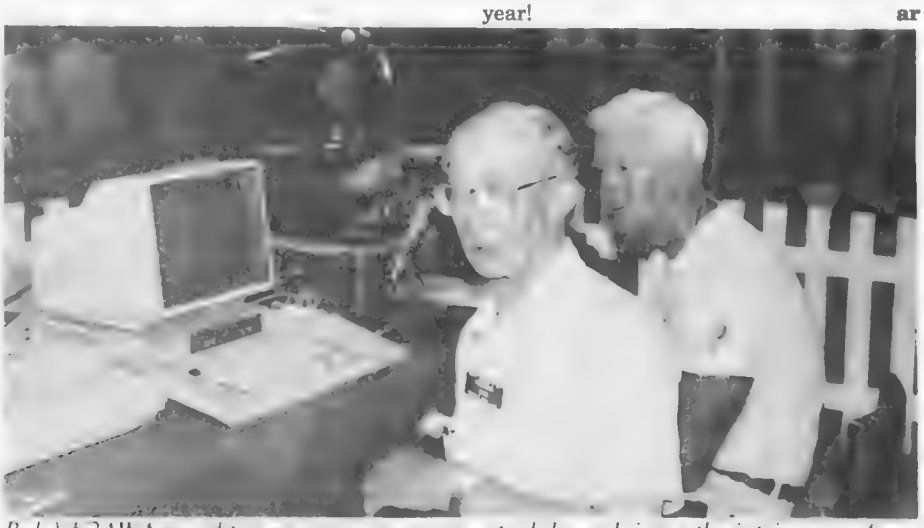
The shopping centre was to be open until 4pm, so the crew settled in and began the task of promoting Amateur Radio to the public. Some people stopped and stared, others came over for a closer look, while a few asked tricky technical questions. Some even completely ignored the impressive display, and went on their way, oblivious to the loss of not having seen the Coffs crew in action!

Club members rolled in at various times through the day, and thus the task of manning the display was made easier for everyone. Some of the faces seen included, Dick VK2RM, Bob VK2AWA, John VK2BUI, Ken VK2DGT, Brian VK2DLM, Merv VK2DMS, John VK2GJK, Emil VK2NEH, Steve VK2YSM.

Packing up the gear and dismantling the

antennas took hardly any effort at all - keeping it simple had made the day.

The consensus was, that as the public interest had been aroused, and we had some fun at the same time, perhaps we should give serious consideration to doing it again, next year! **ar**



Bob VK2AWA caught in an expressive moment while explaining the intricacies of Packet Radio. Brian VK2DLM looks on intently!

HF, Packet, ATV on display at the shopping centre.

ties on the Ham Calendar. Don't miss out on it in 1990, it is sure to be bigger and better.

Overall winner of events was Paul VK3DIP. Runner up was Alex VK3BQN. Home Brew Competition Winner was Moss VK7IP with an excellent 1296 2C39 Linear Amp. Home-Brew Antenna Competition Winner for best performing 144 MHz antenna was Charlie VK3BRZ, while the best 70 cm antenna was produced by Paul VK3DIP.

Raffle Winner	$100 Petrol	Ross VK3CBL
2nd Prize	-	Cliff VK3CCB
Door Prize	-	Bob VK3BNC

The Ballarat Amateur Radio Group would like to thank the many firms and smaller traders for setting up stalls on the day. Thanks also to all those who attended and made it our Best Ever Hamvention. The club would like to hear of any ideas that may improve it in any way. **ar**

Ballarat Hamvention 1989. L to R Paul McMahon VK3DIP, Andy Squires VK3DTO, George Fowler VK3DOK

Report On Ballarat Hamvention

KEVIN HUGHES VK3WN

On Sunday 29th October 1989 the Ballarat Amateur Radio Group held its annual Hamvention at Sebastopol, 7 kms south of Ballarat. Over 300 amateurs and their families attended. Forty trading tables were in full swing with the latest in ham gear, as well as preloved equipment. Most visitors went home with cars full, after seeking out the bargains.

Visitors from VK 2, 3, 5, 7, 9 were present. A delightful barbecue lunch was served along with fruit salad and cream. Free coffee and drinks were on tap all day. The catering was carried out by the Ballarat Amateur Radio Group Ladies.

The Ballarat Hamvention is now well established as one of the most enjoyable activi-

Ballarat Amateur Radio Group member Jeff Pigdon with a group of Scouts from 1st Woady Yallock Scout Group at JOTA 1989.

QSLs FROM WIA COLLECTION (20)

KEN MATCHETT VK3TL HON CURATOR WIA QSL COLLECTION
PO BOX 1 SEVILLE VIC 3191

Italian Somaliland

As mentioned in last month's article, present-day Somalia was formed from the former British colony of British Somaliland and Italian Somaliland. It is a Muslim country which has been designated by the UN as a "Least Developed Country". Even since gaining independence in July 1960, the country has been plagued by political unrest and army revolts. Starting off as a Parliamentary Democracy (which lasted until 1969), the country has become a Republic under military leadership. The country's main economy is livestock-rearing, but it has a long history as an Arab trading post exporting supplies of frankincense and myrrh to Saudi Arabia and other Middle East countries.

The former colony of Italian Somaliland (also referred to as "Somalia") lay to the east with its shore line bordering the Indian Ocean. To the north it extended to the "Horn of Africa". The colony had its origins in 1889 when the Sultan of Zanzibar sold his ruling rights over the territory to Italy. Thus the Italians became interested in Somalia quite late, compared with their English counterparts. It was the Horn of Africa (the most north-easterly part of the continent) that was the only area not then claimed by either the English or the French (The latter power had established trading posts in what is present day Djibouti, just to the west of Somali). Widely felt changes in colonial administration resulted from the fascist regime of Mussolini, who came to power in 1922. After Italy's defeat in East Africa (in 1941), the military administration continued to depend greatly upon the Italian civilian population in the colony to operate public services. Although administered by the British, Somalia remained an Italian possession in all but name, but this ended when allied leaders at the Potsdam Conference in 1945 agreed that former Italian colonies would not be returned to Italy at the end of the war.

MS4A

This QSL, dated May 1949, resulted from a QSO by Ted Jenkins, VK3QK (SK) who was licensed in 1937. Bearing the uncommon prefix MS4, it was used for a short time after World War 2 by Italian stations in Somaliland. The MS4 prefix was used concurrently with the British occupation forces prefix of MD4 and was sometimes listed together with that prefix in DXCC country lists. It was gradually replaced by I5 call-signs.

I5AAW

Nowadays one associates the prefix I5 with stations in the Tuscany region of Italy, but it was used in the 1950s, by stations in Italian Somaliland. The letter I was amongst the earliest prefix assignments made and was given to Italy together with its colonies. Despite this, we find no listing of the actual I prefix for Italian pre-war external territories, although the country of Italian Somaliland itself is listed. It was, (and still is) ARRL policy to refrain from identifying "new countries" with prefixes until the official prefix allocation by government has been made. Thus the country was listed without an accompanying prefix. A trusteeship was gained by Italy over its former colony in 1949, but it is interesting to note that before this date the former Italian colony was still identified as "Italian Somaliland" in early post-war DXCC listings, despite the fact that Italian colonial rule had come to an end long before. After the granting of the trusteeship to Italy, the country was again referred to as "Italian Somaliland" and the I5 prefix was then used, the first of such prefixes being issues in the early 1950s. The I5AAW QSL (dated Jan 1956) shown here was from an Italian national, Carlo Bortoloni. On the reverse side of the card, Carlo states that he was the wireless technician for the Italian Oil Co at Bender Belia, 600 miles north-east of the capital city of Mogadisco. It was a QSL resulting from an Australian SWS report by the late Eric Trebilcock, BERS-195, one of the best-known short-wave listeners in the world of amateur radio.

Thanks

The Wireless Institute of Australia would like to express its thanks to the following ror their contribution of QSL cards towards the Collection :

(Supplementary List)
Bill VK4LC (ex VK3AHO)
Frank VK2QL
Tom VK6MK
Barry VK5BS
Ray VK3RF
Doug VK4UG
Bill VK4UB (ex VK9WD)
Stan VK3UE (VK4LF)
Chinese Radio Sports Assoc. (BY4AA)

Also to the friends and families of the following "silent keys" (Supplementary List)

Eric Thomas VK3ZL
Cardwell (Cardy") McQuillan VK3ACD

Thanks **ar**

DX QSL Contributors' Ladder

(See "AR" March 1989)

Herewith a list of contributors together with special QSLs that have kindly been donated to the WIA Collection (Supplementary List):

Barry VK5BS	Prefixes: S88, 3XI, RZØ, UG5, P4Ø
Ray VK3RF	Prefixes: JY4, 9i15, W2Ø, HT7, JWI, P43, 9ZY, 6J5 (Revilla Gigedo) 9H5Ø, UK4, RZ1, Special Calls : YTØEXY, J73A
Frank VK2QL	Prefixes: DL5Ø, JAIBRK/JB8 (Torishima), XU9, Special Calls : DUØPAR, HM9A/P

As mentioned in last month's notes, a new Contributors' ladder has now been formed. The winner of the 1989 competition was Robin VK6LK from Margaret River in Western Australia and one of our top DX-ers. More to say about this in a future issue of "Amateur Radio".

The 1990 DX QSL Contributors' Ladder:

Ray VK3RF	24 points
Barry VK5BS	12 points
Frank VK2QL	8 points

Everybody starts from scratch again, but the task of adding to the WIA collection of prefixes and especially allocated call-signs is becoming increasingly difficult (even for our best DX-ers) but why not give it a go? Please write for a "Wanted Prefixes" list.

Thanks to all contributors. Keep up the good work. If you would like to play a part in building up the WIA QSL collection and to save something for the future, would you please send a half dozen (more if you can spare them) QSLs which you feel would really help the collection along. All cards are appreciated, but we especially need commemorative QSLs, special event stations QSLs, specially assigned QSLs (eg VK4RAN) pre-war QSLs, unusual prefixes, rare DX and pictorial QSLs of not so common countries. Could you help? Send to PO Box 1, Seville 3139, or phone (059) 643 721 for card pick-up or consignment arrangements for larger quantities of cards.

EDUCATION NOTES

Brenda Edmonds VK3KT
PO Box 565 Mt Waverley 3149

As described in another part of this issue, the devolvement procedures are now almost completed. The February exam will be in the traditional form, with the Regulations based on the old Handbook, but after February the only examinations to be conducted by DOTC will be those for "special cases" where a candidate is unable for medical reasons to attempt a normal exam.

There are now over forty names on the circulation list for devolvement materials. Each of those by now should have received the three Questions Banks, the Morse code generating computer disc, the "procedures" manual and the computer program for generating exam papers from each bank. This represents not only a considerable amount of effort by the Examinations Officer (practically single-handed) but also a significant cost which the DOTC has borne. It is to be expected that in the future some degree of cost recovery may have to be imposed.

At the Executive meeting in November, it was resolved that, on completion of the devolvement organisation, the WIA should recognise the effort and efficiency of the Examinations Officer in an appropriate manner. He is to be congratulated on both the care and attention given to the job and on the manner in which he kept all interested parties informed during the process. He seems also to have stimulated renewed interest where enthusiasm for devolvement had been flagging when the machinery was moving so slowly.

The organisation is now sufficiently advanced for intending examiners to start submitting papers for accreditation. The procedures have been discussed previously. It is recommended that at first the papers be taken wholly from the question banks, as that will speed the process and allow better comparison or papers. There will inevitably be some hitches and hiccups in the early stages, but at present all seems to be going smoothly.

I have previously asked for input from those running classes or intending to arrange exams. I would now like to set up an informal committee, with representation from all Divisions, to monitor the new system, to provide exam facilities for those who may not have easy access to them, to extend and review the question banks and to collect, collate and circulate as much information as possible.

A trial period of one to two years is probably needed for us to be able to identify any questions which should be deleted, and to build all the banks to a satisfactory size and distribution. If any readers have on hand questions that they are prepared to contribute to the banks, I would be happy to receive them and submit them for inclusion. Those who have access to the printed version of the banks will be able to work out which sections would benefit by being extended.

The handing over of examination procedures to the amateur body is a major advance in the history of our hobby, probably equal in importance to the establishment of the Novice licence. We have the opportunity now to examine candidates under conditions which suit them, at any time. It is to be hoped that all those who are at present on the mailing list will maintain their interest, and that a few more from other areas will join, so that we will have nationwide coverage. I look forward to hearing what you are doing about exams in your area. If I can assist in any way, please write to the above address. **ar**

DIVISIONAL NOTES

FORWARD BIAS

Phil Clark VK1PC

Hi there!

Well, forward bias has not appeared for a while and I have been asked to have a go, so this is my first attempt!

The ACT division has had quite a few activities recently, the biggest one being the Esanda International Car Rally, held on the 17th, 18th and 19th of November.

The ACT division was requested to provide safety and scoring communications for the event, which was held over a large area, extending from the central area of Canberra out into the Brindabella ranges to the West. Paul VK2CJ, volunteered to organise the division's role. (I reckon he must want his head read to volunteer for this!). In the final outcome, he was commended by both the rally organisers and the divisional participants for his work. Paul planned for two nets to operate simultaneously using the two metre repeater located on Black Hill, near the Tidbinbilla deep space tracking station, and the 70 cm repeater on Isaacs Ridge. The reason for this selection instead of the repeaters on Mt Ginini was because of terrain masking of the path to Mt Ginini from some parts of the rally circuit.

The entire communications system operated faultlessly from start to finish of the rally, and was able to pass scores back to rally control with such efficiency, that an updated position list was able to be faxed back to crews and drivers in the field within 20-30 minutes of section scoring being done! Thanks must go to the ladies who operated the station at rally HQ for the way they handled a tremendous volume of traffic, and a special thanks to rally director Mike Bell for his help and advice.

In all, some 30 amateurs took part during the rally. The safety communications proved their worth on several occasions, when it was necessary to clear people or vehicles from the rally course while the rally was in progress! There are just too many to mention individually, so a general thank you and a very well done to all who took part

The final divisional meeting for 1989 was held on the 27th of November, and was the traditional social meeting and trash and treasure night. Conviviality was the theme, and it certainly made the bargaining for treasure spirited and the trash to look like treasure!

The first meeting for 1990 will be held on 22nd January.

The division has an interesting program lined up for meetings in 1990, (the new decade in case you did not notice!) and one meeting that will interest a lot of mobile operators will be the one where Paul, VK1BX will give a talk on connections, return current paths and electronic compatibility in the harsh electronic environment of motor vehicles.

I would like to thank the many speakers who have entertained and educated us at the meetings during 1989, particularly those from the electricity authority and the NSW SES.

If you have any suggestions for speaker subjects at the monthly meetings, let any member of the committee know, and we will try and fit them in. Our aim is to provide what the members want.

Some other activities that have proved popular are the reintroduction of fox hunts and the division's buying program that has provided equipment and parts to members at discount prices. These will be continuing in 1990.

I would like all members to give some thought to nominating for committee positions at the Annual General meeting coming up soon. It is NOT a hard job and does not take up much time, but it will give you a chance to see some of the day-to-day problems that crop up with the running of the division. If you feel that something is not being done correctly, or that you have the knowledge and experience to do something better for the division, this is your opportunity to make a valuable contribution.

Well, I hope that all had a safe and pleasant Christmas/New Year (and that you got lots of amateur goodies!) and I look forward to seeing you at the meetings during the year.

VK2 NOTES

TIM MILLS VK2ZTM

Welcome to 1990

This is another important year for the WIA - 80 years ago it was started in NSW and over the following couple of decades there were Divisions formed in every state. It is the Division which even today continues to provide the Membership Services with a national point to cover the government and international liaison. These tasks, as well as production of our magazine 'AMATEUR RADIO' are all funded by our annual Membership dues. This year regrettably has seen an increase in the annual dues, and it is now that the majority of Members receive their renewals. The continued membership of everyone is important but there may be a few who feel the new level beyond their means.

There are several grades of membership and the VK2 Division amounts are lower than the recommended dues. Full and Associate are $59.00; Concession, Needy and Student $47.00; and No "AR" (old Family grade) $33.00. The fee consists of both a Divisional and Federal component. The Divisional amount on the $59 and $33 levels is $10.00 and on the $47 is $7.80. It is from the Divisional portion that the various Membership Services are funded, like the Library, Office, QSL Bureau, Broadcasts, to name a few.

Annually there is a small percentage of Members who for various reasons do not renew. If you fall within this grouping please contact the Divisional Secretary so that we may be aware and in turn save the Division the expense of reminder notices. There may also be ways that the Division can assist, if it is the level of the annual fee which may be preventing you from renewing.

Don't forget there is the option of renewing for a three year period at three times the appropriate annual fee.

Hopefully, the majority of the Membership takes an option which includes our magazine "AMATEUR RADIO", for the printed word is important in conveying all forms of information about the hobby and the Institute.

The next important method of Membership information is via the Divisional broadcast - the first for 1990 will be on January the 14th.

May 1990 be a good year for you in all matters, including "Amateur Radio".

Broadcast and Office

The first formal broadcast for 1990 will be on Sunday the 21st January. There will be a transmission of technical material at the usual times, 1045 and 1915 on Sunday the 14th, including any major items of news to hand. During the holiday period the telephone news headlines on (02) 651 1489 will be updated as required. A note to clubs and groups who submit items for the broadcast. Please write or type these separately to any other matters sent to the office, it helps everyone.

Taree is the latest region to be added to relays of the broadcast, using local repeaters. Automatic relays of the Sunday broadcasts from VK2WI are made into Wollongong, Western Blue Mountains, Central Coast and Newcastle. Manual relays are made at Orange, Tamworth and Lismore and now Taree. It would be nice to see this coverage also extended into the mid North Coast, New England, Far South Coast and the Riverina. Perhaps clubs in these regions could think about it. The additional HF frequency on 30 metres, 10125 kHz is proving useful. There are times when there has been signal fadeout and 40 continues to support statewide coverage. There were a couple of occasions late last year when 40 was out and 30 carried the day.

The Parramatta office is closed over the holiday period. The first day will be Monday the 15th and the first Wednesday evening will be the 17th. Mail to PO Box 1066, Parramatta, NSW 2124 will be regularly cleared and processed.

Slow Morse Sessions

There has been a time shift with the VK2BWI - 80 metre morse practice sessions until the end of daylight saving in March. The new time will be 8 pm, EAST (0800 UT) start on the usual frequency of 3550 kHz. The session will be followed by the VK5 segment. If you are able to assist by being an operator for the VK2BWI sessions, would you contact Ross VK2BRC, via the net for details. The present operators do an excellent job, but additional personnel on the roster helps ease the work load.

WICEN (NSW) Inc

Exercise dates for 1990 include the Bungonia Cave rescue training weekend, March 10th and 11th. The City to Surf early August. The Hawkesbury Canoe Classic, the 3rd & 4th November.

Coming Events

Sunday the 18th February for the Gosford Field Day at the usual venue, the Gosford Showground. Urunga Convention over Easter and the Oxley Region Field Day in June. Regular events like the Trash and Treasure afternoons and Postcode contests will be notified in the broadcasts.

New Members

A warm welcome is extended to the following who were in the intake of new members for November 1989.

P L Beard	VK2AFX	Armidale
B L Bennetts	VK2BBE/ VK1BB	Ocean Shores
R H Brockman	Assoc	Blackheath
G I Denney	VK2JGI	West Wollongong
J A Goodwin	VK2KHJ	Walcha
K W Grimm	VK2XHM	Figtree
J A Heath	VK2DVH	St. Marys
A J Herro	VK2PZG	Strathfield
D Hoy	Assoc	Harrowitch
E S Lensson	VK2XHC	Newtown
N F Murphy	VK2GAN	Old Bonalbo
D Milgate	VK2KHF	Gilgandra
S McFadyen	Assoc	Crows Nest
H Schwitter	Assoc	Cowan
V N Stafford	VK2XOI	Copacabana
A Stone	VK2VTS	Berkeley
R A Steel	Assoc	Walcha
A Umhang	VK2CO	Toongabbie
C E Webb	VK2CO	Unanderra
M T Welsh	Assoc	Berala
D R N White	Assoc	Goolwa

VK3 NOTES

JIM LINTON VK3PC

New Federal Councillor

The WIA Victorian Division Council has appointed Peter Maclellan VK3BWD as Federal Councillor for Victoria. He will represent the Victorian Division on matters of national or international importance. The Federal Councillor sits on the supreme policy making body of the WIA, the Federal Council, which consists of a Councillor from each of the seven autonomous Divisions.

Peter Maclellan's appointment as Federal Councillor has been welcomed by Peter Mill VK3ZPP who steps down from that office, but will continue to play a role as the Alternate Federal Councillor. The Divisional President, Jim Linton VK3PC, remains as 2nd Alternate Federal Councillor.

Microwave Users Register

Do you use the microwave bands, or know of others who do? Then let the WIA Victorian Division know so a microwave users register can be started. The allocations on these higher bands could be under threat - and

unless the WIA is aware of activity on them, it's a difficult task to adequately defend these bands based on accurate information.

The register would also enable the WIA Vic Div to contact microwave users to seek their views. Send details of callsigns, bands and modes used to : Microwave Register, WIA Vic Div 38 Taylor Street Ashburton Victoria 3147.

Classes for a Declining Hobby

Classes in theory and Morse Code instruction will be conducted by the WIA Victorian Division starting next month, in the eastern suburb of Canterbury. Classes for the Novice licence begin soon. Anyone interested would be advised to urgently contact the Divisional Office as soon as possible. Enrolments are also open for an AOCP bridging course which begins in August.

The hobby of amateur radio in Australia is experiencing a downturn, with virtually no growth in the numbers of radio amateurs. The annual growth rate has slumped to about one half of one per cent. We should be attracting CB operators who have tasted excellent DX during this sunspot cycle peak, and other interested in hobby communications. Our hobby is for all age groups. We have a product to market. It is competing with many other leisuretime activities. So, concerned about the decline in radio amateur numbers, the WIA begins 1990 with a think-tank exercise to find effective ways of promoting amateur radio.

Examinations Service

Trial Novice and AOCP theory exams have been conducted by the Division for prospective radio amateurs and those wanting to upgrade. Requests for trial exams have been received from throughout Australia. The exercise was very labor intensive but proved worthwhile. Sets of the trial papers are still available at a cost of $12 per exam, which includes an answer marking service.

Perhaps you are, or know someone who is, a candidate for the DOTC exams next month - the trial theory exams could help with preparation for the real exam. While on the subject of exams, the WIA Victorian Division has submitted a series of theory and regulations examinations to DOTC for approval, to be used when the Division begins conducting exams in March under the devolvement process.

ar

This space could be earning you money!

5/8 WAVE

JENNIFER WARRINGTON VK5ANW

VK5WI

A Short (?) History of the 40-metre Relays

Well, that was what I intended when I thought of the idea, but like the proverbial 'snowball going down-hill' the whole thing started to gather momentum and I was in danger of being overtaken! I would like to thank the three current operators Murray VK5ZQ, Ross VK5KF and Ron VK5ZR, whose assistance I sought in obtaining the details. Little did I know, that this information would take me back much further and become far more complex than I ever imagined. Added to this I decided to look up 'VK5WI' in Marlene Austin's book - it runs to four pages! Here then are just some of the highlights in the history of '5WI' and in particular the 40m Relay of the Sunday Morning Broadcast (if the editor decides that I've exceeded my quota we may have to continue this next month!)

VK5WI started as 'S519' on Sept 6th 1921. In Nov 1924 it became '5AV' and became '5WI' on 28.6.1925.

6.9.33	Division accepted an offer by Cliff Moule (callsign unknown) to broadcast official Institute news on 80m on Sunday nights.
5.12.34	Telephone approved for 5WI on 80m.
1.9.35	Students Tx 'VK5WI Junior' now on air. (note: Big Tx 5WI, conspicuous by its absence!)
1.6.37	Les Pearn VK5PN conducts the WIA session on 7Mc at 9am. (it's interesting to note that Chris Whitehorn the current 5PN, also plays a big part in Sunday morning broadcasts, as an operator, as co-ordinator of the roster of relay ops, and as a past (and currently relieving) Producer.)

The war intervened, then in March '47 Reg Harris VK5RR did the B/cast on 7195 kHz on Sun at 10am. By Aug that year there was also a B/cast on Sun at 7.30pm, but it's not clear whether both continued together)

(Reg has recently returned as a 10m Relay Op!)

28.2.59	5WI, 10am, 7146 kHz to be relayed on 50, 144 and 288 MHz.
7.7.59	B/cast time changed from 10am to 9am to fit in with use of 7146 kHz by other Divisions.
6.6.61	Approval granted for relays to be conducted on 3.5, 14.2, 50.2, 144 and 292 MHz.
16.8.63	Council Members to be rostered to prepare material and a tape-recorder to be purchased. Neil White VK5WN to relay B/cast on 1.8 and 50 MHz.
May '64	Murray VK5ZQ had (according to Marlene's book) been operating '5WI' (presumably on 7 MHz at this was still the originating frequency). Preparastion of tapes was done by Geoff Taylor VK5ZCQ (now TY) and Brian Tideman VK5TN.
30.3.68	Ross Dow VK5KF did some frequency checks, etc. with Geoff VK5TY to prove relay OK, and on 31.3.68 Ross did his first relay from 3.5 to 7 MHz. (This is where it gets a bit confusing. Murray remembers swapping frequencies with Ross at some stage to avoid interference problems that Ross was suffering)
4.8.68	5WI changed to 1.8 MHz for the originating B/cast.
25.8.68	John Godsen VK5LV did the originating B/cast on 1.8 MHz. Murray was relaying on 80m and Ross was relaying on 40m which he continued to do until unpredictable work commitments on Sunday mornings forced him to give up on 28.10.73.
7.4.74	Murray shifted to 40m, where presumably he continued to do the relay every week until June '78, when Ron VK5ZR joined him and they continued to alternate each week for the next 7 years.
3.3.85	Ross once again joined the team, and they have been doing it on a three weekly basis ever since.

I don't know how many man-hours of dedication this would add up to, but I know that it must be 100s. To say 'THANKYOU' to these three seems somehow very inadequate.

Diary Dates

Jan 23rd 1990	Buy and Sell Night (brief business meeting with ESC, Publications, QSL Buro, etc)
No meeting on	Jan 30th
Feb 27th	General Meeting - Speaker, Ian Hunt VK5QX on "Mobile Installations" **ar**

INTRUDER WATCH

GORDON LOVEDAY VK4KAL FEDERAL INTRUDER WATCH CO-ORDINATOR
RUBYVALE 4702

The New Year should begin with all new promises to oneself. Mine is not to let up on new ideas re Intruder Watching. So this month I'll start with a few basics. Technical knowledge possessed by monitoring personnel may vary from the elementary to the very advanced. Regardless of their level of skill, ALL monitors are capable of providing useful input to their section of Monitoring System.

The basic equipment for any monitoring station is a radio receiver, antenna and a pair of ears (one will do), PLUS the operator's ability to learn the limitations of each. Being volunteers, monitors must be free to dedicate as much of their time to the MS as their personal commitments permit. It is suggested that LESS than 2 hrs weekly results in loss of familiarity with patterns of activity on the bands being monitored. Monitors who wish to specialise in specific types of transmissions, i.e. A1A or F1B only, should do so. Some monitors prefer to check a particular band., This I encourage. The end result is a person with an intimate knowledge of the particular brand. Modern receivers leave very little room for inaccuracy. However, older receivers' dial readings can be improved by :

1. Maintaining a constant room temp.
2. Using a crystal calibrator to check the dial accuracy against a recognised frequency standard. All calibration should be done on the band and in the mode being used to detect the intruding signal.

Next month I hope to cover the Frequency measurement of signals. **ar**

SILENT KEYS

We regret to announce the recent passing of

Mr J S Burns	VK5UJ
Mr Norv Canfield	W6KKF

Norv Canfield W6KKF

It is with deep regret that I advise the passing of a very dear friend Norv Canfield W6KKF of Petaluma, California. At the age of 88 years, Norv became a silent key on 17th October 1989.

A real "old old timer". Norv transmitted his first unlicenced radio signals prior to the first world war. His original callsign 9BVY was listed in 1922.

Norv was a very proud member of the Radio Amateur Old Timer's Club of Australia. He obtained pleasure from reading the club's journal.

Over the years, from our first CW contact, our friendship with the Canfield family developed. My wife and I had the pleasure of being a part of that family when we visited Petaluma in May 1983.

Communication over recent years has been via the mail man.

Norv is survived by his wife Rose and daughter Arlene and her family to whom we extend our deepest sympathy.

We reflect on very happy memories but mourn the passing of Norv Canfield W6KKF.

Al Pearson VK2CU. **ar**

OVER TO YOU

ALL LETTERS FROM MEMBERS WILL BE CONSIDERED FOR PUBLICATION AND SHOULD BE LESS THAN 200 WORDS.
THE WIA ACCEPTS NO RESPONSIBILITY FOR OPINIONS EXPRESSED BY CORRESPONDENTS.

Hands Free

I refer to a letter by G H Cranby VK3GI in the October issue regarding the use of a microphone while mobile. Also other correspondence on this subject.

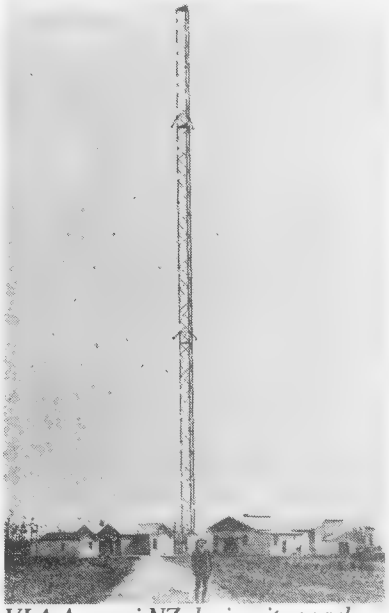
Your readers might be interested in a homebrew item I used for some years on my Mazda Capella.

The head restraint on this car is supported on two chrome rods inserted into the back of the seat and I fitted a plastic zippy box between these supports.

Inside the box was a speaker facing forward, and a battery. On the passenger side of the box was fitted an elbow and into this was screwed a flexible gooseneck with an Electret microphone element in the end.

On the front of the box, towards the passenger side, I fitted a lever switch with the lever

1990 New Zealand Celebrates



VLA Awanui NZ during its spark transmitter career.

In 1990 New Zealand will celebrate 150 years of Nationhood from the signing of the Treaty of Waitangi in 1840. Coincidentally, it will be 60 years since the NZ Post and Telegraph "spark" wireless station VLA closed down. From February 10th through 28th 1990 radio amateurs will celebrate both events with the operation of an amateur station on the site of the old station. The special callsign ZM1VLA will be used, and operations will be phone and CW and packet modes on all bands throughout the above period. A special QSL card will be sent to all stations who contact ZM1VLA.

The photograph shows how VLA looked in 1913. Now only the buildings (in good repair) and the massive guy anchors remain. The original station operated 600 and 2000 metres with power levels near 10 — 15 kw. The mast stood some 400 feet high, and was felled in February 1930.

Awanui is located near the northernmost point of North Island, New Zealand.

B H ROWLINGS
(ZL1WB)
TRUSTEE ZM1VLA
ar

extended by a piece of nylon tube about 2 inches long. The microphone was lined up towards the left of my mouth and did not hinder any movement.

To speak, the right hand was quickly brought up to the left shoulder, the switch snapped down and the hand back to the wheel in a second without taking the eyes from the road.

To receive, it only required a lift of the left shoulder to operate the switch. The transceiver, a Philips FM320 UHF CB unit was fitted under the dash in the usual manner.

PETER A RUSSELL L50567
17 ABELIA ST
ELIZABETH VALE 5112

Subsidies and other Topics

The WIA should apply for a federal government subsidy. Other magazines do. Even homosexuals received a magazine subsidy, still continuing as far as I know. Yes, Alan Williams — VK3GAW — the government can take over your station for various reasons and even deputise others to do so. Prices of publications here as well as overseas, have all risen steeply. The escalating cost of paper is one factor.

How many of these publications give concessions to certain groups? As for comments by HWM Kop-VK5KUJ (Sept 1989), yes we certainly need many more members. If he thinks he is paying too much then why not leave some of his other organisations, maybe all, except the WIA which exists to serve all amateurs. We need a powerful lobby or voice or the day will come when there will be no amateur bands — no amateur radio. We must lobby hard or go under.

I cannot see why limited licensees should not be allowed to use 10 metres via cross-band repeaters.

Regarding HF without morse, any federal government can drop these requirements any time they like along with the allocation of any bands.

Look what happened to the 6 metre band and Channel 0, the 11 metre band and even sections of what was the amateur 80 metre band. Politicians are interested in votes. International or any law takes a back seat to votes.

Re "JOTA or JOKE" I have seen similar behaviour by uncontrolled juniors, bored, and uninterested. Solution (A) leave them home or take them somewhere else or (B) chain them up outside! I think, David (VK4BGB), you will find these "whingers" will be loudest if there is any loss in our band or operating privileges. In fact they will be the first to blame the WIA.

GRAHAM J MUIRHEAD VK4WEM
23 CUNNINGHAM ST
WARWICK 4370

(Your Division has volunteered to investigate the possibility of a subsidy, Graham. The answer to your unpublished question about videotapes is the listing by VK5KG on p38 of the Nov 1988 issue. Ed)

Justifying The Amateur Service

WARC '92 will be convened to revise part of the International Table of Radio Frequency allocations. The revision might affect the amateur allocations so Executive has decided to seek representation on the Australian delegation.

The form of representation and its effectiveness is suggested by various statements made recently, for example:

From DOTC Doc 70, 71 and 72 — "Because of changing technology and changing community needs, no user has a permanent right to any portion of the spectrum, which is a public resource". and "Renewal (of a licence) is not and can not be automatic due to changing community demands on the radio frequency spectrum".

A senior UK DTI officer — "Any moment that the radio spectrum stands unused because of regulatory constraints when somebody could be using it, is an opportunity cost or loss that makes the community that much poorer".

Those quotes, and many similar indicate an administrative concern that spectrum use must be a cost benefit to the community. The amateur service cannot justify its spectrum occupancy with a cost benefit analysis. Therefore it must prove that "self training, intercommunication, and technical investigation carried on by amateurs" is worth foregoing opportunities for commercial profit. That is a task for every member of the service. It cannot be entrusted to one or two representatives.

The report of the 1959 WARC by the late John Moyle was published in AR, March 1960, and summarised in AR, Sept '79. Two quotes are relevant — "...Amateur problems, important though they are to us, are only a small part of the incredibly complex pattern of modern communications. "and — "I believe that every Amateur who tacks his licence to the wall must shoulder an inescapable responsibility to his fellow Amateurs and to the Amateurs of the future. If he fails them, they must suffer and may even cease to be".

There is much apathy to be corrected. paying an annual subscription is not the end of member responsibility. Members must offer for service in divisional councils and aspire to Executive status. An entrenched group of officials is the first indication of a decaying organisation *(ie no new volunteers. Ed).*

The highest priority task for Executive is to convince members that they should care about survival, which depends on the community and administration assessment of their worth.

LINDSAY LAWLESS VK3ANJ
BOX 112 LAKES ENTRANCE 3909

Cost Of Membership

Thanks for a super magazine.

There has been some correspondence recently regarding Membership of the WIA. I would like to add my "Two penny worth".

I have recently been in contact with the Editor of the Australian Ultra Light Magazine and have enclosed the correspondence for your perusal and possible inclusion in your Magazine. I have underlined what I consider to be the nub of the reply from the Ultralight Federation. *(Space does not permit reprinting. Essentially it states that flying an Ultralight necessitates a Federation-issued certificate. Ed)*

With the current policy of Devolvement by DOTC it would seem logical that the WIA not only conduct examinations for potential Amateur Radio Operators, but also issue their licences. In other words, you don't get a Radio Station Licence issued or renewed unless you are a financial member of the WIA. The WIA would then make one bulk payment to DOTC for all the bands that Amateurs are authorized to use.

As an aside, ask the average golfer or bowler how much an afternoon's sport costs by the time they pay green fees, a few beers and the odd raffle ticket. Blokes I have spoken to spend more on a Saturday afternoon than I do in a year on my Ham Licence and WIA membership.

RAY HINKS VK4LU
4 PLANT ST WEST END
TOWNSVILLE 4810

Smug And Pompous

As a rank and file member of the WIA, I should like to protest at the smugness, the pomposity and the patronising attitude which permeates every utterance of the Federal Executive Office, whether it is printed in Amateur Radio or contained in the Federal tapes broadcast each week. As an example, in attempting to justify the forthcoming Federal fee increases, the Federal Office has said, in effect, "It is all too complex to explain, and you would have to be involved with the Federal body to understand, but be assured that the current managerial structure is necessary, and this fee level is necessary to support it". Well, I, for one, remain unconvinced.

The Executive Office apparently fails to realise that the WIA present membership, although less than fifty percent of licensed amateurs, has been sustained at that level by two groups. One group is those who want to

receive Amateur Radio, mainly because of its technical content, while the other feels that it is essential that the amateur fraternity has a representative body. When the contents of recent issues of Amateur Radio are examined, it would appear that the former group has little incentive to continue membership. The latter group, while adhering to its views, must be increasingly doubtful as to the suitability of the present Executive Office to represent it, and increasingly reluctant to pay escalating fees to finance the empire-building program on which the Executive Office seems to have embarked. The outcry which I have read and heard concerning future fees leads me to believe that, when these fees become effective, the defection of members from the WIA will be much greater than the Executive Office expects. Consequently, fees for remaining members will become progressively greater and will, by the law of diminishing returns, eventually result in the demise of the present structure. This will be no great loss and will clear the way for the emergence of a representative body confined to fundamental issues and requiring only moderate fees. Such a body would undoubtedly receive widespread support. As far as I am concerned, such a development cannot come too soon.

S V Ellis VK2DDL
82 Taree St Tuncurry 2428

(We have obviously failed to convince you, OM! You did not give your first name. When "the way is cleared" who is offering to form your "representative body"? Might it not be better to improve the existing body rather than hasten its destruction as you seem to desire? Ed)

Appeal From India

I am an enthusiastic Ham radio opertor having call signVU2MBX, licence no 2754, Grade II, working as a lecturer in medical college.

I am writing this letter because my personal efforts at assembling a station have failed. Construction is very difficult because for old circuits we cannot get valves and new ones use unobtainable things like toroids. No company manufactures Ham equipment in India. The only source is surplus or import. Most do not sell their equipment because they are still using it. Import of new instruments with duty @ 25% will cost RS 25,000 which is as costly as $25,000 would be to people on Australian salaries.

I am the only Ham in this city and have been using stations of friend hams in Rajkot City which 90 kms away by road.

I wonder if any of your readers could extend help to me. I would be delighted to get any surplus out dated HF or 2 metre rig or kit. Anything of medium power which can be made to work.

Thanking you in anticipation.

Maganlal A Gadhia VU2MBX
Dept of Physiology
MP Shah Medical College
Jamnagar Gujarat State 361008
India

VNG

There has been a good deal of publicity in AR during the last year about this station. So far I have not seen a single benefit detailed that supports its re-introduction. Perhaps its continued operation benefits some users, but whom?

On the other hand the VNG transmission interferes with the reception of WWV, a service which has served a large and widely dispersed "consortium" for decades.

WWV has enhanced its capabilities during this time, but it has always maintained its basic simplicity. That is, accurate time signals preceded by a plain launguage message are transmitted virtually every minute.

This facility is of greater value to a much larger "consortium" of user that those seeking to resurrect VNG and should be maintained free from interference.

I would suggest that the WIA should give this matter further consideration and adopt a policy that will ensure WWV can continue to be used in future decades.

D H Watkins VK2DDR
9 Willawa Street Balgowlah
NSW 2093

Have you entered the WIA 80 competition?

This month is your last chance.

Remember, to win you must be financial as at 1st February 1990

BACK ISSUES
of AR available to WIA members

Jan 1969 to Dec 1987
$2.50 each
Jan 1988 to current issue
$4.00 each
(Some issues out of stock)

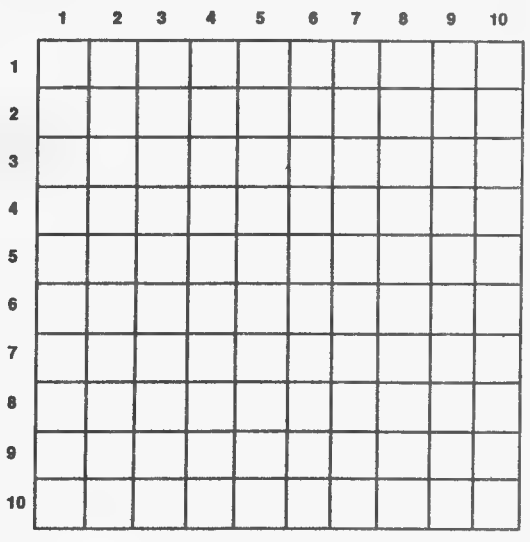
Prices include postage
AR Back Issues
PO Box 300
Caulfield South Vic 3162

Morseword No 34

Solution on page 63

Across
1 Swerve
2 Unoccupied
3 Discourteous
4 Submerge
5 Inlet
6 Very dry
7 Everyone
8 Expectorate
9 Negligent
10 Bulk

Down
1 Icy rain
2 She's a fairy
3 Untruths
4 Top pupil
5 Lease
6 Part of speech
7 Squander
8 Knife
9 Platform
10 Nullify



Audrey Ryan © 1989

SYDNEY ATV

Barry McNeil VK2 FP
Sydney ATV Group
PO Box 142 Winmallee 2142

As secretary of the Sydney ATV group (SATVG), I have noticed the lack of liaison and even awareness other ATV groups within Australia. I was recently posted to Melbourne and had the pleasure of discussing ATV with Peter Cossens, VK3BFG and the VK3 ATV boys. I am now on a posting in Brisbane, and am ATVing with the SEQATV group. I have realised that the groups throughout Australian need to liaise more closely. This is evidenced by the fact that in trying to work out gentlemens' agreements with band plans, ideas etc, many a long and expensive call on the 600 ohm line has been made between ATV groups.

The SATVG has a gasbag net every Monday night at 1930 local with net control being viewed on TV ch 35. The ATV repeater is crosslinked on to repeater 147.300, for those stations without access to ch 35 or for mobile or portable stations. ATV sound is on the repeater's output, whilst stations calling in on the repeater have their sound come out on ch 35. Access to our repeater is via 426.25 MHz horizontally polarised. If you do not have TV sound, then 2 metre sound via 147.400 is re-transmitted on ch 35. Our ATV simplex liaison frequency is 147.425 MHz. The repeaters are at Springwood in the Blue Mountains west of Sydney. A tuning test card and information pages are transmitted whilst the repeater is not in use. This only operates at certain times however. Repeater control is via 2 metres touch tone; a picture alone will not trigger it, nor will a carrier as a picture detector is fitted. Our repeater output is 120 Watts peak horizontal sync into four 4 element horizontally polarised beams which the local white cockatoo community turned into a community perch. A magnificent effort has gone into the building of the repeater by our president Julie Kentwell VK2XBR, who succeeded where all others have failed in establishing a working Sydney group, and for building a fine repeater. Much credit must go to other members, for their excellent contributions, such as Ralph, VK2ZRG, Paul VK2PMD, John VK2TJM, etc, and of course myself, for writing this magnificent article for you! (Modest too, Barry? Ed.)

The Sydney ATV group has close ties and excellent communication with the Gladesville ATV group, which transmits live programs as well as WIA news, excellkent AOCP training video thanks to Ron, VK2DQ, and other programmes of technical interest. Gladesville transmits on Wednesdays from 1900 local. This program is retransmitted on Friday evenings from 1900 local, as well as transmissions on Saturday and Sunday from 1700 local.

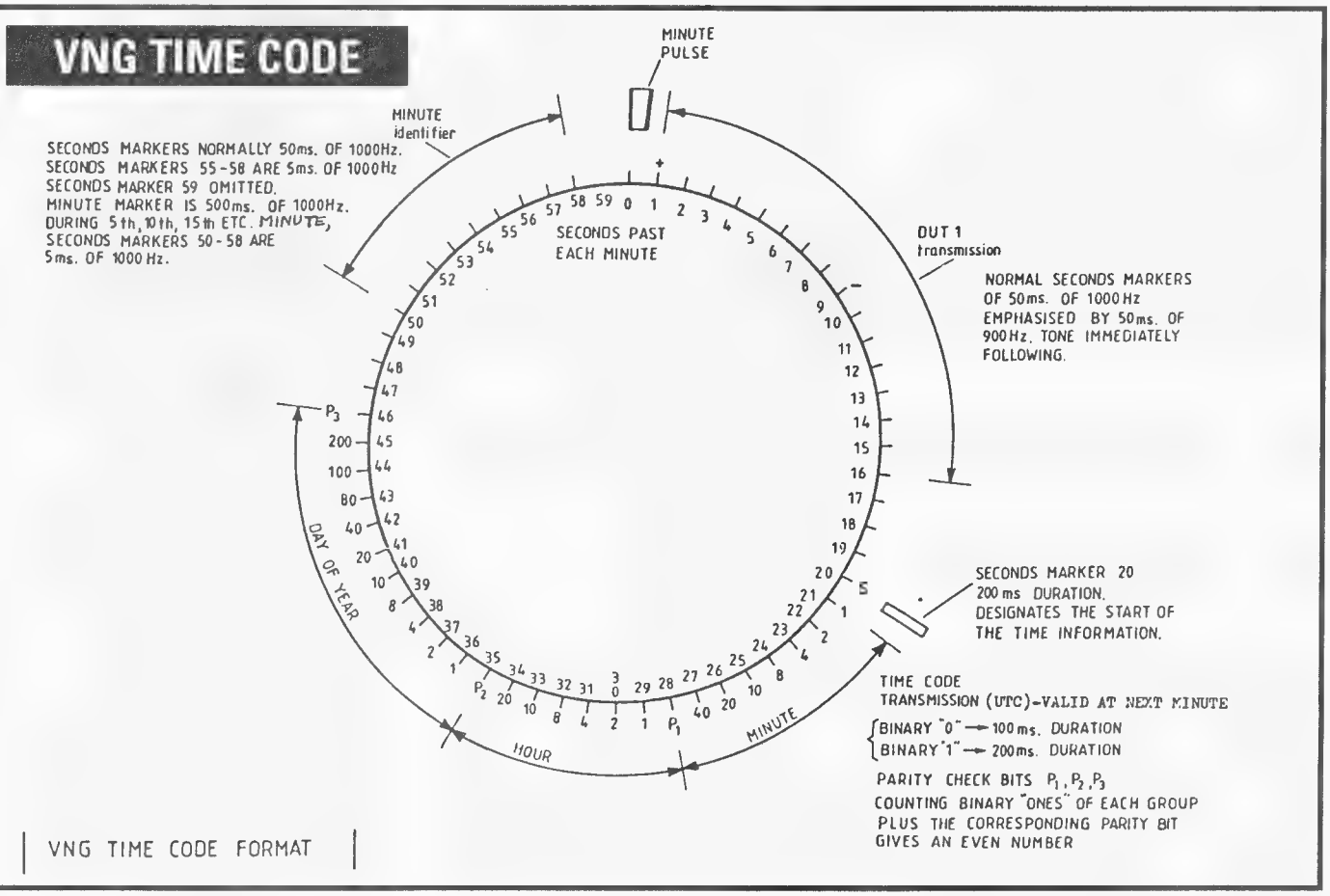
The SATVG also transmits the WIA morning news broadcast every Sunday morning on ch 35 ATV sound.

Recently, the SATVG ran a live telecast from a Cessna 172, the aircraft being piloted by myself, and Wayne VK2XWC at the camera. However, due to fault in the aircraft transmitter, this was not as successful as we would have liked. The next attempt will be more successful, having learned by our test flight. When we do, you will read about it in your magazine.

Despite rumors from interstate that the SATVG is dead and dying, we are going from strength to strength, and it is growing bigger each day. We are here to stay. Written correspondence to the SATVG can be sent to us at PO Box 142 Winmallee 2142.

From now on, the SATVG will be monitoring 3620 kHz during our gasbag net on Monday evenings from 1930 local. We look forward to hearing from the other ATV groups and interested parties throughout Australia and overseas. **ar**

VNG TIME CODE


MINUTE PULSE
MINUTE identifier
SECONDS MARKERS NORMALLY 50ms. OF 1000Hz.
SECONDS MARKERS 55-58 ARE 5ms. OF 1000Hz
SECONDS MARKER 59 OMITTED.
MINUTE MARKER IS 500ms. OF 1000Hz.
DURING 5th, 10th, 15th ETC. MINUTE,
SECONDS MARKERS 50-58 ARE
5ms. OF 1000Hz.
SECONDS PAST EACH MINUTE
DUT 1 transmission
NORMAL SECONDS MARKERS OF 50ms. OF 1000Hz EMPHASISED BY 50ms. OF 900Hz. TONE IMMEDIATELY FOLLOWING.
SECONDS MARKER 20
200 ms DURATION.
DESIGNATES THE START OF THE TIME INFORMATION.
TIME CODE
TRANSMISSION (UTC)-VALID AT NEXT MINUTE
BINARY "0" → 100 ms. DURATION
BINARY "1" → 200 ms. DURATION
PARITY CHECK BITS P1, P2, P3
COUNTING BINARY "ONES" OF EACH GROUP
PLUS THE CORRESPONDING PARITY BIT
GIVES AN EVEN NUMBER
DAY OF YEAR
HOUR
MINUTE

VNG TIME CODE FORMAT

HAMADS

TRADE ADS

SATFAX: Weather satellite picture receiving program for IBM XT/AT. Displays in 64 colours. Needs EGA colour monitor & card, AM demodulator & ADC interface. $45 + $3 postage *** RADFAX2: HF weather fax, morse & RTTY receiving program for IBM XT/AT. Needs CGA, SSBHF, FSK/Tone decoder. Also "RF2HERC": & RF2EGA", same as RADFAX2 but suitable for Hercules & EGA cards respectively. $35 + $3 postage *** All programs are on 5.25", 360K floppy & full documentation. ONLY from M.Delahunty, 42 Villiers St. New Farm 4005 QLD. Ph (07) 358 2785.

AMIDON FERROMAGENTIC CORES: For all receiver and transmitter applications. Send large SASE for data and price to RJ & US Imports, Box 157, Mortdale NSW 2223. (No enquires at office please...11 Macken St, Oatley). Agencies at: Geoff Wood Electronics, Lane Cove; Webb Electronics, Albury; Electronic Components ACT; Truscott Electronics Vic; Willis Trading Co WA; Associated TV Service Hobart.

FOR SALE — ACT

YAESU FT-ONE transceiver C/W key paddle and manual $1900.00 Kenwood TS520 C/W digital readout and manual $550.00. Kenwood TS820 C/W external speaker and manual $700.00. Wilson 4EL 20/15/10 Yagi unused. Realistic DX160 coms receiver C/W external speaker $80.00 Trio SG402 sig gen 100 kHz-10 MHz $200.00 Trio SG202A audio gen 20Hz-20kHz $200.00, 12V 2A power supply $15.00. Welz 100 W dummy load $40.00. Kenwood YK88CN xtal filter $60.00. 28 MHz mobile antenna $30.00. Morse key. Log periodic antenna — possibly 8 elements enquires to Eric VK1EP (062) 49 6437 QTHR All above reasonable offer accepted.

FOR SALE — NSW

YAESU FT209R hand held $375 ono and Tektronix S4-5B oscilloscope mainframe type with dual channel plug-in and probes $250 ono John VK2XNJ 673 2308.

YAESU FT7HF transceiver plus FL110 amplifier. Good condition. Amplifier has fault on 40m. Jeff Brill VK2FBK (069)311490 QTHR VK2KBK $450.

YAESU FT102 150 Watt HF transceiver, with narrow SSB filter, wide AM filter, YM-38 desk mike, SP-102 speaker and manuals. $1150 ono.
TRIO 1303G oscillosope/RF monitorscope $200 ono.
ATN 11 elt 70cm yagi, new, unused $90 ono. Paul VK2ATR (049) 59 1788 (Bh) (049) 59 3748 (AH).

DSE Commander 2m TXVR in good working order $190 Rick VK2KRH (048) 71 1067 after 5pm licensed amateurs only.

TRANSCEIVER FT7 pwr supply mike SWR meter phones morse key manual vey good condition. George VK2YT phone 625 2602.

YAESU FT101E transceiver in excellent condition with oskerblock — $450. VK2BAL (02) 44 4135.

TRIO TS520D HF transceiver in VGC with DG5 digital readout, 12VDC module, CW filter, spare finals & driver manual & mods. $575. Ken VK2YKM (066) 24 2433 (BH) (066) 24 3197 (AH).

YAESU FT480 2 metre allmode transc.with speech read-out $525 ono. Frank VK2ZI QTHR (080) 88 2000.

YAESU FT209RHA 2m transceiver FWB4 battery PA3 charger car adapter MH12A2B speakermic YC18C — charger all in as new condition. Price $500 (063) 67 5095 QTHR VK2DBI.

YAESU FV107 external VFO good condition suit most older Yaesu transceivers $75 (063) 67 5095 QTHR VK2DBI.

FOR SALE — VIC

CICADIA 300 dataphone modem. $150.00 in VGC — ono. Radio Shack, DMP100 dot matric printer with serial and parallel connections plus also a new ribbon and manual $200, ONO VGC must sell — Arthur VK3CUA QTHR Ph (054) 43 7425.

ICOM 27IA 2 mtr all mode 5 or 25W mic manual excellent cond. $975 licenced amateurs only. Andy VK3UJ QTHR (03) 735 3335.

SAGEM teleprinter with tape punch and reader. Dot matrix printer and power supply. Very good condition $300 ONO VK3CQ QTHR or phone (057) 55 1158 (BH).

YAESU FT400 good working order with matching speaker and desk mike 1 spare final tube $300 ONO Charlie VK3KAY (053) 31 7425.

TONO 7000E communications computer C/W manual, circuit and many spares $465. Sanyo VCA-700 B&W CCTV system C/W manual $300. VK3KC Ken (051) 27 4054.

STAND alone Viatel modem complete with push button phone, full alpha-numeric keyboard hardly used. $75. VK3XRS (Roger) phone (051) 56 8291.

FOR SALE — QLD

YAESU FTV-700 transverter. All mode. 2 metre and 70cm modules. Connecting cables, original packing, manual. Recently serviced by authorized agent. $500 — Ross VK4IY QTHR (075) 65 1445.

3 section 55ft hills telescopic/hinge-over tower excellent condition $300 ONO. John VK4WLX QTHR tel (071) 94 7443.

FOR SALE — SA

TELCON semi air spaced twin coax 2kW to 2m, transmitting tubes 4-65A; 4E27(813) Grundig reel-to-reel recorder two sets tubes KW2000; Portable Diathermy 600 watts 7 metres; Postwar receiving tubes new ribbon micro — VK5LC QTHR (08) 271 6841.

FOR SALE — WA

DECEASED estate FT-101E $350. FRG-7 $200. 2m FT-203R $350, (Plus car adapter). Emtron AE tuner EAT-300A $100. Clipsal Morse Key $25. Kenpro Rotator Control Box $100. VK6AST QTHR (09) 454 6877.

FOR SALE — TAS

600HZ CW filter for FT101E Yaesu transceiver Col VK7LB QTHR (003) 39 3171.

WANTED — ACT

KINGSLEY radio type K/CR/11 RAAF type AR7 with the five bands ABCDE coils. Les Jay Dickson College VK1NAT (062) 47 5377.

WANTED — NSW

TRIBAND beam also antenna tuner (066) 72 2462 VK2AVS QTHR.

POWER SUPPLY for BC779 receiver (Hammarhund Super Pro). Also looking for old battery chargers, eliminators and rectifier units eg Emmco, Tungar, Philips, Valley, Balkite, etc. Also needing old transmitting tubes for collection. Brian VK2EFD QTHR (049) 77 2178.

TS130 WARC bands price and condition to Bill (042) 32 2892 night.

WANTED — VIC

TRS80 cc (6809E) EC basic programs for AR or any other type of CC programs. Hoping to put a library together will be much appreciated (disk or tape). Arthur Pantazis 62 Honeysuckle St Bendigo 3550 PH (054) 43 7425.

BOOK secret warfare by Pierre Lorain translated by David Kahn. Phil VK3APG (052) 48 1461 QTHR.

WANTED — QLD

FILTERS for TS43OS YK88CN YK88SN YK88A; manual or copy for Plessey oscilloscope TSG802 also TSG402 reimbursement paid. R Male 13 Henzell St Redcliffe 4020 (07) 284 6432.

BALUN for dipole, quantity co-ax also ant changeover switch VK4EAB (071) 83 5162.

OLD mantle model b/c receiver even if not working but complete — QTHR Barrie VR4LN (071) 82 2675.

BG 348 RX — working — BC221 — Command tnx — any frequency — QTHR Barrie VK4LN (071) 82 2675.

BUY manuals or circuits army PRC26 set, 8C reception set, university TST12 valve tester, parts list army 128 set or can swap other manuals VK4EF 97 Jubilee Tce Bardon QLD 4065 (07) 366 1803 AH please.

WANTED — SA

MINI-PRODUCTS HQ-1 hybrid quad mini-beam in working condition reasonable price. Bill VK5NWL QTHR (08) 255 6976.

WANTED — WA

REQUIRE volumes 6-8-9 Australian Radio Service Manuals. Have for exhange vols 1 & 11. Roy VK6COP QTHR. (09) 457 8179.

WANTED intruder watch observers in VK6 free tapes logs and assistance available contact VK6RO Graham on (097) 451 3561 or QTHR.

Support the advertisers who support Amateur Radio magazine.

AR 20 YEAR INDEX

IBM format 5 1/4 inch floppy disk dBase III Plus

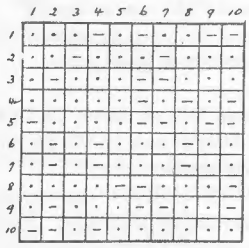
.DBF file	**$10.00**
ASCII	**$10.00**
Compiled .EXE file	**$10.00**
36 page printout	**$5.00**

Prices include disk (where applicable) and postage.

AR 20 Year Index
PO Box 300
Caulfield
South Vic
3162

Solution to Morseword No 34

From page 60



Across:
1 skew 2 idle 3 rude 4 sink 5 bay
6 arid 7 all 8 spit 9 lax 10 mass

Down:
1 sleet 2 fay 3 lies 4 dux 5 hire
6 noun 7 waste 8 stab 9 dais
10 negate

HAMADS

Please Note: If you are advertising items For Sale and Wanted please use a separate form for each. Include all details; eg Name, Address, Telephone Number (and STD code), on both forms. Please print copy for your Hamad as clearly as possible.
*Eight lines free to all WIA members, ninth line for name and address Commercial rates apply for non—members. Please enclose a mailing label from this magazine with your Hamad.
*Deceased Estates: The full Hamad will appear in AR, even if the ad is not fully radio equipment.
*Copy typed or in block letters to PO Box 300, Caulfield South, Vic 3162, by the deadline as indicated on page 1 of each issue.

*QTHR means address is correct as set out in the WIA current Call Book.
*A courtesy note will be forwarded to acknowledge that the ad has been received.
Ordinary Hamads submitted from members who are deemed to be in general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re—sold for merchandising purposes.
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❑ Miscellaneous
❑ For Sale
❑ Wanted

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Call Sign: .....

Address: .....

.....

State: .....

STOLEN EQUIPMENT

Stolen in October from the home of R Ross-Wilson VK2FIT 111 James St Leichardt 2040

- Kenwood TS440S with tuner Ser No 7090271
- Kenwood PS50 power supply
- Kenwood MC85 desk microphone

Contact owner or local police

Stolen from A M Simpson VK4AAE Mt Nebo Rd Jolly's Lookout Via Samford on Friday 27 October 1989

- YAESU FT-290R 2M transceiver with Nicads Ser No SF280702
- Telequipment Oscilloscope Mod. S51
- EMTRONICS noise bridge Ser No EM342
- YAESU FT707 WARC HF transceiver with the following:
- YAESU FC-707 antenna tuner Ser No 1N180265
- YAESU FV-707DM external digital VFO Ser No OLO60097
- YAESU FP-707 power supply Ser No 4C050487

Contact owner VK4AAE or your local police station. **ar**

TRADE PRACTICES ACT

It is impossible for us to ensure the advertisements submitted for publication comply with the Trade Practices Act 1974. Therefore advertisers and advertising agents will appreciate the absolute need for themselves to ensure that, the provisions of the Act are complied with **strictly.**

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The opinions expressed in this publication do not necessarily reflect the official view of the WIA, and the WIA cannot be held responsible for incorrect information published.

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Fill out the following form and send to:

The Membership Secretary
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PO Box 300
Caulfield South, Vic 3162

I wish to obtain further information about the WIA.

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Radio Amateurs: Have you checked out EA lately?

No doubt most radio amateurs are aware that *Electronics Australia* is by far this country's largest-selling electronics magazine, as well as being its oldest (we began way back in 1922, as *Wireless Weekly*). But have you looked inside the magazine lately?

Remember Jim Rowe, VK2ZLO? Jim used to be Technical Editor, and then Editor – back in the late 1960's and 1970's. You may recall some of the amateur radio and test equipment projects he developed, which proved to be extremely popular. Well, Jim is back at the helm of the magazine, and has been busy giving it a new lease of life.

You'll now find lots of new 'departments' in the magazine, including Solid State Update (with news of new semiconductor devices), Silicon Valley Update (news from the USA) and What's New in Entertainment Electronics. Plus all of your old favourites like Forum, The Serviceman, Circuit and Design Ideas and so on. And of course plenty of 'meaty' technical articles and contruction projects.

FEATURES IN OUR JANUARY ISSUE:

AMATEUR RADIO KITS IN AUSTRALIA & THE USA

The first of two articles by Tom King, VK2ATJ, surveying what's available in kits for radio amateurs both here and overseas. Don't miss it if you're into home brewing!

25 AMP POWER SUPPLY FOR 13.8-VOLT GEAR

Commercial power supplies of this rating cost over $700, but you can build this one for much less. It's really husky, too...

SIMPLE 6M RECEIVER

Another project to encourage more home brewing: a low cost, easy to build FM receiver tuning 50-54MHz, and suitable for use as a tuneable IF.

What about *amateur radio* projects? Well, as you can see there are more of these than before – but but we're very interested in publishing more. So if YOU have developed an exciting amateur radio project, please contact Jim Rowe by writing to him at EA, 180 Bourke Road, Alexandria 2015. Or phone him on (02) 693 6620, to discuss the possibility of publishing it as a contributed article. As well as earning a fee, you'll also be helping to boost interest in amateur radio!

Take a look at the new, rejuvenated *Electronics Australia* – on sale at your newsagent at the beginning of every month. Or subscribe now, by phoning (02) 693 9517 or 693 9515.

Electronics Australia

Australia's Top Selling Electronics Magazine

WITH ALL THE FEATURES IN ICOM'S NEW MOBILE TRANSCEIVERS, IT'S A WONDER THEY'RE STILL MOBILE.

ICOM have packed so many functions into the IC228A and IC2400A mobile transceivers, you'd think there was no way you could still make them so compact. (It might explain why nobody else has made a transceiver with so many features).

One of the features both transceivers share is back lit control knobs for visibility in bad lighting conditions.

There are various power outputs across the range, from 25W to 45W.

For novices, the 228A can be reduced to 10W.

The programmed Scan function scans all frequencies between two programmable set frequencies, while the Memory Scan function scans all memory channels except, of course, those you lock out.

Thanks to the pocket beep, you'll never miss a call. By installing a UT-40 Tone Squelch Unit (this is sold separately) the transceiver functions as a pager. When the frequency of a received tone equals the tone frequency you set, a thirty second alarm is emitted over the speaker.

As for monitoring the input frequency when you work a repeater, that's as simple as pushing the Monitor Switch on the front panel to open the squelch and check the frequency.

Every five seconds, Priority Watch in the IC2400A monitors the operating Channel, and one or all memory channels in succession. And that's while you operate! No longer do you have to flip back and forth between frequencies.

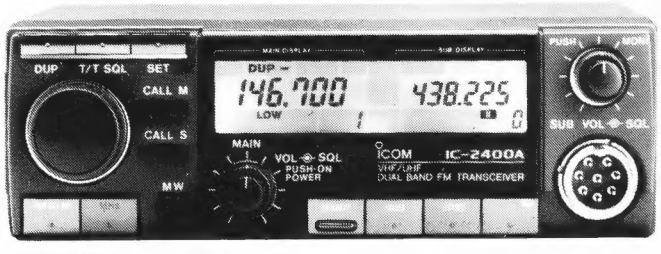
While the IC228A has 20 memory channels the more advanced IC2400A has 40, plus two call channels. Each channel stores all the information required to work a repeater.

With the IC2400A there are 20 double-spaced memory channels for 2 metres and 70 cm.

What's more, the IC2400A offers full duplex facility. Which means you can now simultaneously transmit on one band and receive on the other. You never have to wait for a long "over". You have full "break in". In fact, you can talk as easily as talking over the phone.

With all these functions in one small compact mobile, it really is a wonder they're still so compact and mobile.

IC228A



IC2400A

Call ICOM on (008) 338 915 for details on ICOM products and your nearest stockist.
Melbourne callers (03) 529 7582. ICOM Australia Pty. Ltd., 7 Duke Street, Windsor, 3181.

ICOM

ICOM Australia's warranty is only applicable to products purchased from their authorised Australian Dealers.

*According to model chosen.

Nichols Cumming Advertising Australia 4615

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